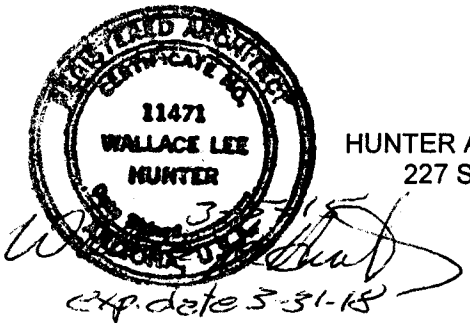
PROJECT MANUAL

ADMINISTRATION ANNEX RENOVATION

197 MAIN STREET
YUMA, ARIZONA
CIP 2.0703

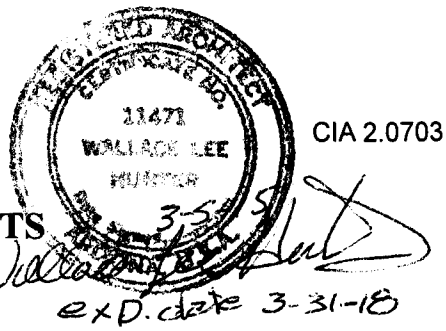
FOR

Yuma County
2351 W. 26th Street
Yuma, Arizona 85364



PREPARED BY
HUNTER AND COMPANY - ARCHITECTS
227 SECOND AVENUE SUITE A
YUMA , ARIZONA

MARCH 2015



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PROJECT DIRECTORY

PROJECT NAME: Administration Annex renovation CIP 2.0703

PROJECT ADDRESS: 197 South Main Street
Yuma Arizona

ARCHITECTS PROJECT NO: 13-17

All questions and information requests shall be made in writing and addressed to the Architect for distribution to appropriate areas.: Direct questions may be in writing by Fax (928) 817-5109, or email Craig.Sellers@yumacountyaz.gov.

OWNER:

YUMA COUNTY
198 S MAIN ST
YUMA, ARIZONA 85364

OWNERS PROJECT MANAGER
Craig Sellers P.E.
2351 W. 26th Street,
Yuma, Arizona 85364.

PROJECT ARCHITECT:
Hunter and Company û Architects
Wallace L. Hunter
227 2nd Avenue
Yuma, Arizona 85364
928-782-6553

Structural Engineer
Campbell Structural

Mechanical Engineer:
Ruff Engineering

Electrical Engineer
JEEE Electrical Engineering

END OF PROJECT DIRECTORY

GENERAL PROVISIONS

Public Works Standards for Yuma County Volumes I and II, an III are hereby made part of these specification except where specifically note otherwise.

all work done under this contract shall be accomplished in accordance with the public works standards for yuma county volume i (dated august, 1998) and volume ii (dated july, 1993) supplemented by these special provisions for this project. when other specifications, standards, details, or documents are referenced, the latest revisions shall be used, unless otherwise specified.

SPECIAL PROVISIONS

The purpose of these Special Provisions is to supplement, modify, replace and/or delete that portion of the Public Works Standards for Yuma County Volumes I and II, given herein, which do not meet specific requirements of this project.

PUBLIC WORKS STANDARDS FOR YUMA COUNTY, VOLUME II
GENERAL CONDITIONS

1.Section 102 Bidding Requirements and Conditions

Section 102.2 Contents of Proposal Pamphlet of the Standard Specifications, first paragraph is revised to read:

The prospective bidder may examine and/or purchase plans, special provisions, and proposal pamphlets at the Yuma County Department of Development Services, Engineering Office. Alternatively, an electronic version of the BID documents is available on line at http://www.yumacountyaz.gov. CAD drawings are not provided to the successful bidder.

The Proposal Pamphlet will state the location of the contemplated construction, give the description of the various quantities of work to be performed or materials to be furnished and have a bid schedule of pay items for which unit bid prices are invited. In addition, it will state the form and amount of the proposal guarantee, the time in which the work shall be completed and include additional instructions not included in these specifications.

The standard plans, project plans, the standard specifications, the standard details, the special provisions, the contracting agency/s supplements and all supplementary documents are essential parts of the contract and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to

describe and provide for a complete work.

Section 102.5 Examination of Plans, Special Provisions and Site of Work of the Standard Specifications is modified to add:

The Bidder shall be responsible to investigate the project site, inspect the ground water levels, satisfy himself as to the actual conditions, anticipate fluctuations in the ground water table and anticipate potential surface water flows as a condition to be encountered in the performance of his work.

It shall be the Contractor/s responsibility to control all water to the extent required to complete the contract items, and to repair and restore all damages due to the ground water fluctuations and surface water flows at no cost to the County. Depth to groundwater in the Project area is unknown. No additional measurement or additional compensation will be made for any additional work required or associated with pipeline excavations, earthwork, structures, protecting work areas, move-out and move-in due to flooding (including flood irrigation), damaged equipment, or dewatering of construction areas, the cost being considered as included in the cost of contract items.

2.Section 103 Award and Execution of Contract

Section 103 Award and Execution of Contract of the Standard Specifications is modified to add the following:

103.10 Standard Specifications and Details

All work done under this Contract shall be accomplished in accordance with the Public Works Standards For Yuma County Volume I (dated August, 1998) and Volume II (dated July, 1993) supplemented by these Special Provisions for this project. When other specifications, standards, details, or documents are referenced, the latest revisions shall be used, unless otherwise specified.

103.11 Plans: The following sealed drawings, in print form, are the plans for this project, as revised:

Sheet No.	Drawing No	Description
1	100	INDEX - GENERAL NOTES
2	205	SITE PLAN
3	206	ENLARGED SITE PLANS
4	207	SITE DETAILS
5	210	BASEMENT DEMOLITION PLAN
6	211	1ST FLOOR DEMOLITION PLAN
7	212	2ND FLOOR DEMOLITION PLAN
8	213	3RD FLOOR DEMOLITION PLAN

9	310	BASEMENT PLAN
10	311	1ST FLOOR PLAN
11	312	1ST FLOOR DIMENSION PLAN
12	313	2ND FLOOR PLAN
13	314	2ND FLOOR DIMENSION PLAN
14	315	3RD FLOOR PLANS
15	319	ENLARGED PLANS
16	320	GENERAL INTERIOR DETAILS
17	321	INTERIOR DETAILS
18	322	INTERIOR DETAILS
19	330	DOORS AND WINDOWS
20	331	DOOR DETAILS
21	333	DOORS/WINDOWS
22	340	BASEMENT REFLECTED CEILING PLAN
23	341	1ST FLOOR REFLECTED CEILING PLAN
24	342	2ND AND 3RD FLOOR REFLECTED PLAN
25	350	STAIRS
26	351	STAIRS
27	352	STAIRS
28	390	CABINETS TREASURE ELECTIONS
29	391	CABINETS - RECORDER
30	392	CABINETS ASSESSOR
31	410	EXTERIOR ELEVATIONS
32	411	EXTERIOR ELEVATIONS
33	412	BUILDING SECTIONS
34	421	WALL SECTIONS
35	422	WALL SECTIONS
36	423	WALL SECTIONS
37	440	ROOF PLAN
38	441	ROOF DETAILS
39	442	ROOF DETAILS
40	500	GENERAL STRUCTURAL NOTES
41	501	NOTES AND SCHEDULES
42	502	SPECIAL INSPECTIONS
43	503	STRUCTURAL SCHEDULES
44	504	GENERAL STRUCTURAL DETAILS
45	505	GENERAL STRUCTURAL DETAILS
46	506	GENERAL FRAMING DETAILS
47	510	BASEMENT STRUCTURAL PLAN
48	511	ENLARGED BASEMENT STRUCTURAL PLAN
49	520	1ST FLOOR STRUCTURAL - FOUNDATION PLAN
50	521	ENLARGED1ST FLOOR STRUCTURAL PLAN
51	530	2ND FLOOR STRUCTURAL MEZZ PLAN

52	531	ENLARGED 2ND FLOOR STRUCTURAL PLAN
53	540	3RD FLOOR STRUCTURAL PLAN
54	541	ENLARGED 3RD FLOOR STRUCTURAL PLAN
55	550	HIGH ROOF PLAN - STRUCTURAL
56	551	ENLARGED HIGH ROOF PLAN - STRUCTURAL
57	560	STRUCTURAL DETAILS 101 - 120
58	561	STRUCTURAL DETAILS 121 - 140
59	562	STRUCTURAL DETAILS 201 - 220
60	563	STRUCTURAL DETAILS 221 - 240
61	564	STRUCTURAL DETAILS 241 - 260
62	600	GENERAL PLUMBING
63	601	PLUMBING SCHEDULES
64	610	BASEMENT WATER PLAN
65	611	BASEMENT WASTE & CONDENSATE PLAN
66	612	1ST FLOOR WASTE AND VENT PLAN
67	613	1ST FLOOR WATER PLAN
68	614	1ST FLOOR CONDENSATE PLAN
69	615	2ND FLOOR WASTE AND VENT PLAN
70	616	2ND FLOOR WATER PLAN
71	617	2ND FLOOR CONDENSATE PLAN
72	618	3RD FLOOR - WATER WASTE AND VENT PLAN
73	619	3RD FLOOR CONDENSATE PLAN
74	620	PLUMBING WASTE AND VENT ISOMETRICS
75	621	PLUMBING DETAIL
76	700	MECHANICAL - GENERAL
77	701	MECHANICAL SCHEDULES
78	710	BASEMENT MECHANICAL PLAN
79	711	1ST FLOOR MECHANICAL PLAN NORTH
80	712	1ST FLOOR MECHANICAL PLAN SOUTH
81	713	2ND FLOOR NORTH MECHANICAL PLAN
82	714	2ND FLOOR SOUTH (MEZZANINE) MECHANICAL PLAN
83	715	3RD FLOOR NORTH MECHANICAL
84	716	MECHANICAL ROOF PLAN
85	720	REFRIGERANT PIPING
86	721	MECHANICAL DETAILS
87	800	ELECTRICAL SPECS
88	801	ONE LINE DIAGRAMS
89	810	BASEMENT POWER PLAN
90	811	1ST FLOOR POWER PLAN
91	812	2ND FLOOR POWER PLAN
92	813	3RD FLOOR POWER PLAN
93	814	PANELS AND SCHEDULES
94	821	BASEMENT LIGHTING PLAN

95	822	1ST FLOOR LIGHTING PLAN
96	823	2ND FLOOR LIGHTING PLAN
97	824	3RD FLOOR LIGHTING PLAN
98	830	ONE LINE ACCESS CONTROL
99	831	1ST FLOOR COMMUNICATION
100	832	2ND FLOOR COMMUNICATION
101	833	3RD FLOOR COMMUNICATION
102	841	BASEMENT - FIRE ALARM
103	842	1ST FLOOR - FIRE ALARM
104	843	2ND FLOOR - FIRE ALARM
105	844	3RD FLOOR - FIRE ALARM
106	910	BASEMENT NORTH FIRE SPRINKLER
107	911	BASEMENT SOUTH FIRE SPRINKLER
108	912	1ST FLOOR NORTH FIRE SPRINKLER
109	913	1ST FLOOR SOUTH FIRE SPRINKLER
110	914	2ND FLOOR NORTH FIRE SPRINKLER
111	915	2ND FLOOR SOUTH FIRE SPRINKLER
112	916	3RD FLOOR FIRE SPRINKLER

Printed and PDF copies of Plans will be provided to Bidders and Contractor.
Electronic copies of the plans, regardless of format or source, are not official copies of the plans. Copy fees apply unless otherwise specified.

3.Section 104 Scope of Work

Section 104 Scope of Work of the Standard Specifications is modified to add the following:

1.104.1.3 Site Cleanup
2.At reasonable intervals during the progress of the work, cleanup and disposal of waste materials and debris will be performed on the project site. Waste materials and debris shall be disposed of by the Contractor at legally established landfill areas, private disposal sites located by the Contractor or as directed by the Engineer.
3.The Contractor shall be responsible for and incur all costs for periodic and final cleanup of the site during construction. Payment for cleanup and disposal shall be an integral part of associated Bid Items shown on the Contract Proposal. No separate payment shall be made for cleanup and disposal. Should the Contractor dispose of excavated soils on a private property, the Contractor shall first review the site with a representative of the Engineer to determine the impact upon any existing floodplains, grading requirements and permitting requirements.

4.Section 105 Control of Work

Section 105 Control of Work of the Standard Specifications is modified to add:

105.5 Coordination of Plans and Specifications

In a case of a discrepancy or conflict, the order in which the various documents shall govern is as follows from highest to lowest: addenda, special provisions, plans, agency/s supplements to the standard Specifications, agency/s supplements to the standard details, standard specifications and standard details

105.16 (C) Substantial Completion
Section 105.19 of the 2008 Arizona Department of Transportation Standard Specifications for Road and Bridge Construction is incorporated into this contract by reference.

5.Section 106 Control of Materials

Section 106 Control of Materials of the Standard Specifications is modified to add the following:

106.1 Source of Materials Quality

The Contractor shall be responsible for providing all materials to the project. No time extensions or adjustments to the contract will be made due to lack of a materials source being available in close proximity to the project.

Any materials source used for the project shall be properly permitted as applicable. Upon request, the Contractor shall furnish documentation showing the materials source used for the project has current permits as required by local, County, State or Federal regulations.

106.2 Tests and Acceptance of Materials

The county will contract with an independent testing laboratory to sample and test materials incorporated into the project. Testing will include but is not limited to soil sampling, establishment of proctors, compaction testing, concrete sampling and testing, and the review of all mix designs. The testing laboratory is required to send one copy of all test results to Yuma County and one copy to the contractor. After the establishment of compactive effort on earth and aggregate (five tests maximum), any retesting due to failed tests will be at the ContractorÆs expense. A supplemental agreement will be executed at the conclusion of the contract to adjust the contract for the Countys cost of retesting compaction.

6.Section 107 Legal Relations and Responsibility to Public

Section 107 Legal Relations and Responsibility to Public of the Standard Specifications is modified to add the following:

107.2 Permits

The contractor shall conform to all the requirements set forth by the Arizona Department of Environmental Quality for the AZ Pollution Discharge Elimination System Phase II for construction sites larger than one acre. The contractor shall submit a Notice of Intent (NOI) to ADEQ and maintain and implement a Storm Water Pollution Prevention Plan on site.

107.6 Public Convenience and Safety

The Contractor shall provide safety construction fencing around all open trenches, excavations, material and equipment storage yards and other work zones during all non-working hours and while unattended.

There will be no separate measurement or payment for furnishing, installing or maintaining protective fencing. The cost shall be considered incidental to the cost of the appurtenant work.

The contractor shall maintain local access to all side streets, access roads, driveways, alleys and parking lots at all times.

107.11 Contractor/s Responsibility for Utility Property and Services Paragraph three is modified to:

It shall be the contractor/s responsibility to provide seven (7) calendar days notice to all appropriate governmental agencies and utility companies prior to starting work affecting their area of concern.

The Contractor/s attention is called to the existence of overhead lines within, crossing and adjacent to the project. The Contractor at all times shall maintain the proper, safe, legal clearances to all overhead lines as required by federal, state and local regulations. During excavation, the Contractor will maintain a minimum of 5 feet of lateral clearance around the base of overhead line poles unless arrangements are made with APS to insure the integrity of the poleÆs foundation.

107.12.1 Air Quality Non-Attainment Area

This project is located within the Yuma PM10 Non-attainment Area for airborne dust particles. Prior to construction the Contractor will be required to submit for approval a Dust Control Plan. The plan must be able to reduce and maintain visible emissions from fugitive dust sources to a minimum daily. The plan should address the following mitigation action items:

A. Control for traffic emission from within the construction site.
B. Control of track out from unpaved areas of the construction site.
C. Control of emissions from haul trucks.
D. Dust control measures at all construction staging areas, detour routes and worksites.
E. Control of dust by the use of covers on all trucks hauling material to and from the project.

Measures to clean paved roads may include, but are not limited to water flushing, vacuum sweeping and manual cleaning of access points.

No measurement or direct payment will be made for this item, the cost being considered incidental to the project.

107.16 Notices

The contractor shall provide written notification to the City of Yuma Parks and Recreation Department two weeks prior to beginning construction. The contractor shall provide the proposed construction schedule, contact personnel with telephone numbers, temporary fencing plans, equipment and material storage plans, anticipated utility disruptions or relocations and any other pertinent information.

7.Section 108 Commencement, Prosecution and Progress

4.108.1 Pre-Construction Conference of the Standard Specifications is modified to add:

5.Prior to and as a prerequisite of the Notice to Proceed the contractor shall provide the County with the following submittals for review and at least five (5) working days prior to preconstruction meeting:

(I)Proposed project materials
(J)Construction schedule
(K)Safety plan
(L)Traffic Control Plan [11x17ö sheet] for every stage of work
(M)Listing of after hours / emergency contact personnel for the CONTRACTOR and subcontractors [include office and cell phone numbers
(N)Equipment List [to include brand, model, year, capacity]
(O)Survey Plan and Schedule
(P)Subcontractors List- [contact name, address, telephone & fax noÆs]
(Q)Dust Control Plan
(R)Material suppliers list [contact names, address, telephone & fax noÆs]
(S)Shop drawings

108.2 Notice to Proceed of the Standard Specifications is modified to add:

After the pre-construction conference and once all required submittals are reviewed, a notice to proceed will be issued by the Contracting Agency.

Neither the Contractor nor any Subcontractor shall commence work on a project prior to receipt of the written Notice to Proceed from the Contracting Agency. The Contractor shall begin work within 30 days after the date of the Notice of Award of contract from the Board of Supervisors. All work under the contract shall be completed within the number of calendar days stated in the proposal, plus any extensions, beginning with the day following the starting date specified in the Notice to Proceed.

8.Section 109 Measurements and Payments

109.2 Measurements and Payments û Scope of Payment of the Standard Specifications is modified to add::

109.2.1 Measure and Payment For Pay Items In The Proposal
The items listed in the Bid Schedule of the Proposal are intended to include the major items for the project; however, there is other work necessary to complete the project. If work to complete the project has not been designated by a specific item on the Bid Schedule, the Contractor shall include the cost for the work in some related bid item so that his Proposal for the Project does reflect the total cost of all necessary and required work to complete the project in its entirety.

109.4 Compensation for Alteration of Work of the Standard Specifications is modified to add:

Adjustment in bid item unit prices shall only apply to major items of work when considering an adjustment for an over run in excess of 20% or an under run in excess of 20%. A major item of work as defined by Section 101 of the General Conditions is an item on the bidding schedule whose total cost is greater than five percent (5%) of the total contract price.

PUBLIC WORKS FOR YUMA COUNTY, VOLUME II
TECHNICAL SPECIFICATIONS

9.Section 201 Clearing & Grubbing

201.1 Description of the Standard Specifications is modified to add:

Clearing and Grubbing shall include removal of trees in the area to be excavated or areas to be filled. Tree removal shall be in accordance with the Yuma County Standard Specifications. Trees or other undesirable or objectionable materials not identified on plans shall also be removed from the site. Payment shall be included in the Clearing & Grubbing bid item.

10.Section 204 Earthwork

204.6 Excavation of the Standard Specifications is modified to add:

204.6.1 Excess or Shortage of Excavation
No borrow or waste area is established for the project. The Contractor is responsible for the disposal of excess excavated material, if any. In the unlikely event there is a shortage of excavated material from which to construct the project, a supplemental agreement for borrow to offset the shortage will be executed provided Yuma County and the Contractor reach agreement on method and price. If no agreement on method and price can be reached the Engineer may order the work done under section 109.05 of the General Conditions.

11.Section 225 Water

225.1 Description of the Standard Specifications is modified to add:

Watering shall include making arrangements for developing water sources and supplying all labor, equipment and materials to collect, load, transport and apply water as necessary for compaction of materials, concrete construction operations, testing, dust control, prewetting and other material and construction uses.

225.2 Water Supply of the Standard Specifications is modified to add:

Water shall be clean and free from objectionable deleterious amounts of acids, alkalis, salts or organic materials.

12.Section 402 Construction Surveying and Layout

402 Construction Surveying and Layout of the Standard Specifications is modified to add the following:

402.1 Description of the Standard Specifications is modified in the first paragraph last two sentences as follows:

The work shall be done under the direction of an Arizona registered professional engineer employed by the contractor. All right of way monuments and lines shall be established by an Arizona registered land surveyor employed by the contractor.

402.4 Construction Requirements of the Standard Specifications is modified to add:

Failure of the contractor to verify control points in writing to the Engineer shall serve to waive any contractor request for additional compensation based on error in the control points.

402.4.1 As-Built Record Drawing

The Contractor shall prepare and furnish As-Builtö record drawings to Yuma County. The Contractor shall obtain one (1) set of plans from the Engineer and shall record in red colored pencil all cases where actual field construction differs from work shown on the plans. All concealed work and utility locations shall be dimensioned. Drawings shall be maintained in a current condition at all times until completion of the work and shall be made available for review by the engineer at all times.

Failure of the Contractor to submit as-builts within 30 days of completion of the project and receive approval by the Engineer for the same shall result in retainage of contract being withheld from payment.

DIVISION ONE - GENERAL

SECTION 01010 - SUMMARY OF WORK

PART ONE - GENERAL

1.01. WORK COVERED BY THE CONTRACT DOCUMENTS:

A Following is a brief description of the overall scope of the Work covered by the Contract Documents. It is not intended to list every item of Work in this Summary. All items of Work shown on the Drawings, covered in the Specifications or designated in any of the Contract Documents are to be included whether listed in the Summary of Work or not.

B The work consists of construction

1 Existing Construction

a Poured in place concrete with concrete beam and floor system between floor and at roof.

2 New construction

a Footings: Reinforced Integral Concrete.

b Floor Structure: Concrete slab on grade. Metal pan system with concrete

c Exterior Walls: Masonry construction and Metal studs bearing walls

d Roof Structure: Steel framing with metal pan and concrete deck

e Roofing: Mineral surface composite roofing

f Interior Walls: metal studs and gypsum board.

g Ceilings: Metal suspension system and acoustical tile, Gypsum board.

1.02. RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

A Section 01040 - Coordination.
B Section 01300 - Submittals.
C Section 01400 - Quality Control.
D Section 01500 - Construction Facilities and Temporary Controls.
E Section 01600 - Material and Equipment.

1.03 BASE BID AND BIT ITEMS:

A Description of BASE BID:

1. All work as called for on the plans and listed in the specification except work of Bid Item One. This bid to include all exterior work, and third floor window repair - exterior wall furr out, ceiling infills of third floor and rough in for all mechanical and electrical for spaces of bid

item one.

2. Allowance: Landscaping and irrigation allowance of $5000.00 shall be include. This allowance is for actual cost, no additional fees and or overhead shall be allowed in the allowance.

3. Unit cost for excavation and Engineered backfill. Include in the base bid for a depth of 2'-6". Additions to or deductions from the Base Bid that may be required after obtaining soilds report, will be calculated on a 6" depth. (1/5 of Unit cost)

B. Description of BID ITEM ONE: Additive to base bid:

1. Interior improvement to rooms 250-252 and 304-320 (Assessor). These improvement for rough interior face of common and exterior walls - floor finishes and ceilings except ceiling infill at third floor roof structure.

2. Mechanical, Electrical items related to the space that are not required by other spaces.

3. Bid items D5, D7, D8, and D9 will be adjusted per base unit cost for actual counts provided and installed.

C: Description of BID ITEM TWO: Deduct from the base bid:

1. Interior improvement to rooms 128-130 and 214-223 (Recorder) These improvement for rough interior face of common and exterior walls - floor finishes and ceilings.

2. Mechanical, Electrical items related to the space that are not required by other spaces.

3. Bid items D5, D7, D8, and D9 will be adjusted per base unit cost for actual counts provided and installed.

1.04. CONTRACTOR'S DUTIES:

A Except as specifically noted, provide and pay for: Labor, materials and equipment
  1 Tools, construction equipment and machinery
  2 Water, heat and utilities required for construction
  3 Other facilities and services necessary for proper execution and completion of the work.

B Pay legally required sales, consumer and use taxes.

C Secure and pay for building and connection permits as necessary for proper execution an completion of the Work.

D Secure and pay for, as necessary for proper execution of the Work, and as applicable at time of receipt of bids, and related to the construction process:

E Government fees.
  1 Give required notices.

F Comply with codes, ordinances, rules, regulations, order and other legal requirements of public authorities which bear on performance of the Work.

G Promptly submit written notice to Architect of observed variance of Contract Documents from legal requirements. It is not Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations.

1 Appropriate Modifications to Contract Documents will adjust necessary changes.
2 Assume responsibility for Work known to be contrary to such requirements performed without required notice.

1.05 CONTRACTS:

A Construct Work under a single lump sum contract.

1.06. CONTRACTOR USE OF PREMISES:

A Confine operations at site to areas permitted by:
1 Law
2 Ordinances
3 Permits
4 Contract Documents
B Do not unreasonably encumber site with materials or equipment.
C Do not lead structure with weight that will endanger structure.
1 Assume full responsibility for protection and safekeeping of products stored on premises.
D Obtain and pay for use of additional storage or work areas needed for operations.
E Housekeeping:
1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operation. At the completion of the Work he shall remove all his waste materials and rubbish from and about the Project as well as all his tools, construction equipment, machinery and surplus materials.
2 If at any time, the Contractor fails to keep the premises free from accumulation of waste materials or rubbish caused by his operation, or perform required clean-up operations, the Owner, forty-eight (48) hours after having given written notice thereof, may do so and the cost thereof shall be charged to the Contractor.

***** END OF SECTION *****

SECTION 01040 - COORDINATION

PART ONE - - GENERAL

1.01. WORK INCLUDED:

A Contractors responsibility for coordination.

1.02 RELATED WORK:

A Administrative and Work Related Requirements: All Sections of Division 1.

1.03. CONTRACTOR / CONTRACTOR, CONTRACTOR / SUBCONTRACTOR AND SUBCONTRACTOR / SUBCONTRACTOR RELATIONS

A The Contractor, all other contractors, and all subcontractors shall coordinate their work with all adjacent work and shall cooperate with all other trades so as to facilitate the general progress of the Work. Each trade shall afford all other trades every reasonably opportunity for the installation of their work and for the storage of their materials.

B The Contractor shall cooperate with the other contractors for proper anchorage and installation of his work. Extraordinary care shall be exercised in engaging work to the other materials, to avoid damaging the work of the other Contractors. The Contractor shall be held responsible for all injuries to the work of other contractors caused by lack of precaution due to negligence on the part of his workmen and all such damaged work shall be removed and made good at this Contractor's expense.

C The Contractor shall allow the Owner, other Contractors, and subcontractors access to the building and permit sufficient time during various phases of the Work for their roughing-in, finishing, etc.

D The Contractor shall notify his subcontractors, and any and all subcontractors or contractors under the Owner, when he is ready for them to install their portion of the Work.

E No Contractor or subcontractor shall cover up or conceal his own work or the work of other contractors until the same has been thoroughly tested and approved.

***** END OF SECTION *****

SECTION 01050 - FIELD ENGINEERING

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Provide and pay for field engineering services required for the Project:
  1 Survey work required in execution of the Project;
  2 Civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.

1.02 RELATED SECTIONS:

A Section 01010 - Summary of Work.
B Section 01700 - Record Documents.

1.03. QUALIFICATIONS OF SURVEYOR OR ENGINEER:

A Qualified engineer or registered land surveyor, acceptable to Contractor and Owner.

1.04. SURVEY REFERENCE POINTS:

A Owner's Representative will identify existing control points and property line corner stakes indicated on the drawings, as required.
B Existing basic horizontal and vertical control points for the Project are those designated on drawings.
C Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.
  1 Make no changes or relocations without prior written notice to Architect.
  2 Report to Architect when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
  3 Require surveyor to replace Project control point which may be lost or destroyed.
  4 Establish replacements based on original survey control.

***** END OF SECTION *****

SECTION 01060 - REGULATORY REQUIREMENTS

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Description of codes and standards.

1.02. RELATED SECTIONS:

A All sections of Division 0 and Division 1.
B Individual Section of the specifications as applicable to the particular part of the work.

1.03. REFERENCES:

A Reference to standard specifications and codes refer to editions in effect at time of proposal and include current addenda if any. Any questions arising during construction as to procedure, practice or requirement in any phase of work shall be decided by the applicable code.
B The Project is designed to be in compliance with the following Codes:

1 INTERNATIONAL BUILDING CODE (I.B.C.) 2012 EDITION
2 INTERNATIONAL PLUMBING CODE (I.P.C.) 2006 EDITION
3 INTERNATIONAL MECHANICAL CODE (I.M.C.) 2006 EDITION
4 GAS CODE IFGC 2006 EDITION
5 NATIONAL ELECTRIC CODE (N.E.C.) 2008 EDITION
6 UNIFORM FIRE CODE (U.F.C.) AND NFPA1 2003 EDITION
7 2010 (FEDERAL AMERICANS WITH DISABILITY ACT)
8 ACCESSIBILITIES GUIDELINES (ADAAG)
9 CITY OF YUMA, ORDINANCES AND REGULATIONS

C In the event that conflicts occur between or among the above codes, regulations and standards, it is intended that the more stringent requirement apply.
D It is not the intent of this Section to require the Contractor to comply with codes, regulations or ordinances which are in direct disagreement with the Contract Documents. In the event the Contractor discovers such direct disagreement, he shall immediately notify the Architect in writing and await further instructions.

***** END OF SECTION *****

SECTION 01200 - PROJECT MEETINGS

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Pre-construction conference.
B Progress meetings.

1.02. RELATED SECTIONS:

A Section 00100 - Pre-Bid Conference.
B Section 01040 - Coordination.
C Section 01700 - Contract closeout.

1.03. GENERAL REQUIREMENTS:

D Schedule and administration of meetings:
  1 Pre-construction meeting - Architect.
  2 Progress meetings - Contractor.
  3 Special meetings -Contractor.
E Description of responsibility:
  1 Prepare agenda for meetings
  2 Distribute written notice of each meeting four days in advance of meeting date
  3 Make physical arrangements for meetings
  4 Preside at meetings
  5 Record the minutes, include all significant proceedings and decisions
  6 Reproduce and distribute copies of minutes within three days after each meeting .
    a To all participants in the meeting.
    b To all parties affected by decisions made at the meeting.
    c Furnish three copies of minutes to Architect.
  7 Representatives of contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
  8 Architect may attend meetings to ascertain that Work is expedited consistent with Contract Documents and the construction schedules.

1.04. PRE-CONSTRUCTION MEETING

A Schedule within 15 days after date of Notice to Proceed.
B Location: A central site, convenient for all parties, designated by Contractor.
C Attendance:

1 Owner's Representative;
2 Architect and his professional consultants;
3 Contractor's Superintendent;
4 Major Subcontractors;
5 Others as Appropriate.

D Suggested Agenda:
1 Distribution and discussion of:
2 List of major subcontractors and suppliers.
3 Projected Construction Schedules.
4 Critical work sequencing.
5 Major equipment deliveries and priorities.
6 Project Coordination
7 Field decisions.
8 Proposal requests.
9 Submittals.
10 Change Orders.
11 Applications for Payment.
12 Adequacy of distribution of Contract Documents.
13 Procedures for maintaining Record Documents.
14 Use of premises:
a Office, work and storage areas.
15 Owner's requirements.
a Construction facilities, controls and construction aids.
b Temporary utilities.
c Safety and first-aid procedures.
d Security procedures.
e Housekeeping procedures.

1.05. PROGRESS MEETINGS

A Schedule regular periodic meetings, as required, one per month minimum.
B Hold called meetings as required by progress of the work.
C Location of the meetings: The Project field office of the Contractor, or as otherwise indicated in the meeting notice.
D Attendance:
1 Architect, and his professional consultants as needed;
2 Subcontractors as appropriate to the agenda;
3 Suppliers as appropriate to the agenda;
4 Others, as deemed appropriate by the Contractor or as requested by the Architect.
E Suggested Agenda:
1 Review, approval of minutes of previous meeting
2 Review of work progress since previous meeting
3 Field observations, problems, conflicts and decisions.

4 Problems which impede Construction Schedule
5 Review of off-site fabrication, delivery schedules
6 Corrective measures and procedures to regain projected schedule
7 Revisions to Construction Schedule
8 Plan progress, schedule, during succeeding work period
9 Coordination of schedules
10 Review submittal schedules; expedite as required
11 Maintenance of quality standards
12 Review proposed changes for
13 Effect on Construction Schedule and on completion date.
14 Effect on other contracts of the Project.
15 Other business.

***** END OF SECTION *****

SECTION 01300 - SUBMITTALS

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A This section outlines, in general, as a convenience to the Contractor, submittals required before commencing construction and during the course of construction of the project including, but not limited to:
   1 Construction Schedule
   2 Schedule of Values
   3 Progress Reports
   4 Shop Drawings, Product Data and Samples
   5 Survey Data

1.02. RELATED SECTIONS:

A Section 01700 - Project Closeout Items.
B Section 01800 - Maintenance Material.

1.03. REFERENCES:

A Yuma County Design Standards Volumns 1, 2 , and 3

1.04. REQUIRED SUBMITTALS:

A Submittals required prior to Bidding:
B Submittals required with Proposal:
C Submittals required prior to Award of Contract:
D Submittals required prior to Construction:
E Submittals required durning construction:

1.05. SUBMITTAL DESCRIPTIONS:

A List of Subcontractors and materials suppliers shall be submitted as required
B Certificate of Insurance shall be submitted to the Owner as required.
C CONSTRUCTION SCHEDULE
   1 Promptly after award of the Contract, the Contractor shall prepare and submit to the Architect estimated construction progress schedules for the work, with sub-schedules of related activities which are essential to its progress.
   2 Submit revised schedules periodically.
   3 Form of Schedules.
      a Prepare schedules in the form of a horizontal bar chart.

b Provide separate horizontal bar for each trade or operation.
c Horizontal time scale: Identify the first work day of each week.
d Scale and spacing: To allow space for notations and future revisions.
e Minimum sheet sizes: 24" x 36".

4 Format of Listings: Contractor's own standard format
5 Identification of listings: By major specification section numbers.
6 Content of Schedules
a Construction Progress Schedule
b Show the complete sequence of construction by activity.
c Show the dates for the beginning, and completion of, each major element of construction.
d Show projected percentage of completion for each item, as of the first day of each month.
7 Submittals schedule for Shop Drawings, Product Data and Samples. Show:
a The dates for Contractor's Submittals.
b The dates approved submittals will be required from the Architect.
c Products Delivery Schedule: Show the delivery dates.

D SCHEDULE OF VALUES

1 The Schedule of Values shall be submitted not later than ten (10) days from the date of "Notice to Proceed" on AIA Document G-702A "Application for Payment Continuation Sheet", for the purpose of a statement certifying that the Schedule of Values accurately portrays the actual value of the work indicated and that the amounts of the breakdown have not been "front-end loaded". Each monthly payment request shall be submitted in the same form with all data required in such a manner that each major item of work is shown as a single line item.
2 The Architect shall issue disapproval of the Schedule of Values within ten (10) days after receipt of the schedule with explanation of items needing correction. Non-confirmation of approval within ten (10) days shall constitute approval of the Schedule of Values.

E PROGRESS SCHEDULE

1 The Contractor shall prepare and submit a progress schedule not later than fifteen (15) days from the date of "Notice to Proceed" for the Architect's approval an estimated progress schedule for the work. The progress schedule shall be related to the entire project to the extent required by the Contract Documents. This schedule shall indicate the dates for starting and completions of the various stages of construction.
2 The project schedule shall be a bar graph form on letter size paper, or multiple thereof.
3 Progress Report:
a The Contractor shall, with his Application for Payment, submit monthly,

updated progress schedules, clearly indicating work completed during the proceeding month and proposed progress of the work for the forthcoming month.

b In addition to the statement of progress, the Contractor shall enumerate all orders placed for major equipment or materials with date of order and, if possible, date of anticipated delivery.

F SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

1 General Requirements

a. Shop drawings, product data and samples shall be dated and marked to show the names of the project, Architect, Contractor, manufacturer or supplier and separated detailer if pertinent. All submittals shall be accompanied by a letter of transmittal containing the project name, Contractor's name, number of drawings, data and samples, titles and other pertinent data.

2 Shop Drawings

a Shop drawings shall completely identify specification section and locations at which materials or equipment are to be installed. Reproductions of contract documents are acceptable as shop drawings only when specifically authorized in writing by the Architect.

b Submit one (1) reproducible sepia transparency and one (1) print of each shop drawing, including fabrication, erection, layout and setting drawings and such other drawings as required under various sections of the specifications, until final approval is obtained.

c The Architect will check the drawings and affix his stamp to the sepia, indicating the action taken, and will return same to the Contractor, retaining the print for his records. Comments, if any, will be noted directly on the sepia.

d The Contractor shall be responsible for obtaining and distributing required prints of the shop drawings to his subcontractors and material suppliers after, as well as before, final approval.

3 Product Data

a Submit three (3) copies of manufacturer's descriptive data including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, wiring diagrams and controls, schedules, and other pertinent information as required. Where printed materials describe more than one product or model, clearly identify which is to be furnished.

b If data is stamped "Reviewed and Approved Except as Noted", one (1) copy will be returned. If stamped "Rejected as Noted", or "Revise and Resubmit", one (1) marked copy and one unmarked copy will be returned. Corrected copies are to be resubmitted for approval as per original submittal. The Contractor shall be responsible for making and distributing any additional copies that he may require.

c Submittals for all major items of mechanical, plumbing and electrical equipment and materials shall be made within fifteen (15) days after receipt of "Notice to

Proceed". Submit all items at one time.

d Equipment submittals shall be complete including space requirements, weight, electrical and mechanical requirements, performance data and supplemental information requested by the Architect.

e Where equipment submittal requires space other than that indicted, submit large scale drawings showing floor space and service clearance.

4 Samples

a Submit three (3) samples of sufficient size to indicate general visual effect. Where a selection of color, texture, finish, grading or other similar property will be made, submit two (2) sets of the manufacturer's color or finish charts illustrating the full scope of this range. One set of "approved" samples will be retained by the Architect.

b Samples and color of finish charts of all materials requiring color or finish selections shall be submitted, within twenty (20) days after "Notice to Proceed" in one submittal to facilitate preparation of the color schedule by the Architect. No color or finish selection will be made until all samples or a finish chart, as required, are received.

***** END OF SECTION *****

SECTION 01400 - QUALITY CONTROL

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Requirements of the laboratory.
B Contractors quality control.

1.02. RELATED SECTIONS:

A Inspections and Testing required by laws, ordinances, rules, regulations or orders of public authorities: General Conditions.
B Certification of products: Respective Specification Sections.
C Test, adjust and balance of equipment: Respective Specification Sections.
D Section 01040 - Coordination.
E Section 01700 - Project Record Documents.

1.03. PAYMENT OF LABORATORY SERVICES:

A Unless otherwise specifically stated in individual Sections, Owner will employ, and pay for, services of an Independent Testing Laboratory to perform specified services.

1.04. REQUIRED INSPECTION, SAMPLING AND TESTING:

A Soils Compaction Control: Section 02200.
B Cast-In-Place Concrete: Section 03300.
C Mortar: Section 04100.

1.05. QUALIFICATION OF LABORATORY:

A Meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories.
B Meet basic requirements of ASTM E 329 "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction".
C Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of any deficiencies reported by inspection.
D TESTING EQUIPMENT:
    1 Calibrated at maximum 12 month intervals by devices of accuracy traceable to either.
        a National Bureau of Standards.
        b Accepted values of natural physical constants.

1.06. LABORATORY DUTIES - LIMITATIONS OF AUTHORITY:

A Cooperate with Architect and Contractor; provide qualified personnel promptly on notice.
B Perform Specified inspections, sampling and testing of materials and methods of construction:
  1 Comply with specified standards; ASTM, other recognized authorities, and as specified.
  2 Ascertain compliance with requirements of Contract Documents.
C Promptly notify Architect, and Contractor, of irregularities or deficiencies of Work which are observed during performance of services.
D Promptly submit 5 copies of reports of inspections and tests to Architect, including:
  1 Date issued.
  2 Project title and number.
  3 Testing Laboratory name and address.
  4 Name and signature of Inspector.
  5 Date of inspection or sampling.
  6 Record of temperature and weather.
  7 Date of test.
  8 Identification of product and Specification section.
  9 Location in project.
  10 Type of inspection or test.
  11 Observations regarding compliance with Contract Documents.
E Perform additional services as required by Owner.
F Laboratory is not authorized to:
  1 Release, revoke, alter, or enlarge on, requirements of Contract Documents.
  2 Approve or accept any portion of Work.
  3 Perform any duties of the Contractor.

1.07. CONTRACTOR'S RESPONSIBILITIES:

A Cooperate with Laboratory personnel, provide access to Work, to Manufacturer's operations.
B Provide to Laboratory, preliminary representative samples of materials to be tested, in required quantities.
C Furnish copies of mill test reports.
D Furnish casual labor and facilities:
  1 To provide access to Work to be tested.
  2 To obtain and handle samples at the site.
  3 To facilitate inspections and tests.
  4 For Laboratory's exclusive use for storage and curing of test samples.
E Notify Laboratory sufficiently in advance of operations to allow for his assignment of personnel and scheduling of tests.
F Arrange with Laboratory, pay for, additional samples and tests required for Contractor's

convenience.

G Employ, and pay for, services of a separate, equally qualified independent Testing Laboratory, to perform additional inspections, sampling and testing required when initial tests indicate Work does not comply with Contract Documents.

1.08. CONTRACTORS QUALITY CONTROL:

A Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work.

***** END OF SECTION *****

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Furnish, erect and maintain temporary facilities
B Furnish, erect and maintain temporary controls.
C Perform temporary work required in the performance of the contract.

1.02. RELATED SECTIONS:

A Section 01010 - Description of Work.
B Section 01400 - Coordination.
C Section 01060 - Regulatory Requirements.

1.03. GENERAL REQUIREMENTS

A All temporary facilities specified hereafter shall comply with the requirements of the Occupational Safety and Health Act (OSHA) and all regulations, ordinances, laws and other requirements of any city, municipality, county, state, federal or other authorities having jurisdiction over the area in which the project is constructed.
B Where the minimum requirements specified hereafter are exceeded by the requirements of the governing authority, those requirements of the governing authority shall be binding.
C The Owner will identify construction and storage areas allocated to the Contractor for the work.
D Remove all temporary construction facilities and controls at completion of the work.

1.04. DETAIL REQUIREMENTS

A Temporary Enclosures:
  1 Contractor shall provide all storage enclosures required for his operations. Limit storage of materials to areas indicated or agreed to by the Owner.
B Temporary Field Office:
  1 Provide suitable and separate temporary office facilities for the exclusive use of the Architect a minimum of 8' x 10' complete with desk, letter file, spread table and chair. The office shall be heated and air conditioned. Provide a minimum of 30 foot-candles of light. Provide proper locking for security and furnish the Architect with keys.
  2 The Contractor shall provide a temporary office facility for his project superintendent with similar requirements of Architect Office. This office shall be kept clean and organized, with copies of all pertinent information for the project, including, but limited to:

a Record drawings, shop drawings, plans, specifications, field orders, change orders, project construction schedules, etc.

3 Contractor shall provide all storage enclosures required for his operations. Limit storage of materials to areas indicated or agreed to by the Owner.

C Toilet Facilities:

1 Provide adequate toilet facilities, as required by applicable ordinance, for the use of all workmen employed on the project, located where directed, and enforce their use by all personnel on the project.

D Utilities:

1 Provide temporary adequate light and power supply for construction, making all necessary arrangements with the serving utility. Lighting levels shall be adequate for performing the work in a proper manner and to enable the Architect to observe the quality of the work. Power shall be properly wired outlets in sufficient quantity to minimize the use of extension cords and of proper electrical characteristics and of adequate capacity for construction equipment in use.

2 Provide temporary water supply for the construction purposes, making all necessary arrangements with the Owner. Minimum acceptable requirements will be to provide at each building location a properly valved water supply.

3 Cost of the temporary light, power and water consumed during the course of the construction shall be paid by the Contractor, the cost of providing such shall be paid by the Contractor.

4 Supply adequate, pure drinking water with individual drinking cups or sanitary bubbler fountain for the use of employees on the project. The quality of the drinking water shall meet the standards for public water supplies specified in the County Health Department Sanitary Code.

5 During the course of the work, interruption of utilities to existing facility must be kept to an absolute minimum. Notification must be given to the Owner 48 hours prior to any such interruption and verified with him prior to shut-down.

E Heating or Cooling:

1 Should it become necessary to do any work in the building at times when the temperature is below or above the minimum specified, the Contractor shall provide temporary heating or cooling for such length of time as deemed necessary by the Architect for the protection of the work. Pay all expenses for temporary apparatus, its installation, proper maintenance and operation and for fuel. Such temporary apparatus shall be approved by the Architect prior to its use on the project.

2 Should temporary heating or cooling be required after permanent heating system is installed and operating, this unit may be used, however, Contractor shall pay any fuel costs and be responsible for proper operation of unit.

F Temporary Construction Equipment And Protection:

1 Provide and maintain all fences, barricades, shoring and other protective structures or devices necessary for the safety of workmen, equipment, the public and property as required by state or municipal laws and regulations, and local ordinances. These shall

conform to all regulations, ordinances, laws and other requirements of the city, state, federal and other authorities having jurisdiction with regard to safety precautions, operation and fire hazards.

a The Contractor shall provide suitable barricades and construction fences to keep unauthorized persons from the construction areas.

2 Provide, install and maintain all scaffold, staging, trestles, and planking necessary for the work in strict conformity with applicable laws and ordinances, and Occupation Safety and Health Act (OSHA), and maintenance of same so as not to interfere with or obstruct the work of other trades.

3 Provide and maintain pumping facilities, including power, for keeping the site, excavations and structure free from accumulations of water at all times, whether from underground seepage, rainfall, drainage or broken lines.

4 Maintain provisions for closing and locking the project at such times as possible to do so.

5 Protect the interior of the building by closing all openings, when so required, with suitable materials when weather or job conditions required.

6 Provide adequate fire extinguishers on the premises during the course of construction, of the type and sizes recommended by the American Insurance Association to control fires resulting from the particular work being performed. Instruct employees in their use. Place extinguishers in the immediate vicinity of the work being performed, ready for instant use. In the use of especially hazardous types of equipment, such as acetylene torches, welding equipment, tar pots, kettles, salamanders, etc., no work shall be commenced on equipment used unless fire extinguishers of an approved type and capacity are placed in the working area and available for immediate use by the workmen using the above-mentioned equipment.

G Project Sign:

1 Furnish and erect Project Signs as attached at the end of this Section, and at a location visible on each of the Main streets of the Project Sites and where there will be no conflict with construction activities.

2 The signs shall be maintained in good condition throughout the construction period.

3 No other signs shall be permitted on the Project sites.

4 Remove the signs when a Certificates of Substantial Completion are issued.

H Special Controls:

1 The Contractor shall take necessary precautions to minimize the dust arising from his operations by wetting the area or by other suitable methods as approved. Permits shall be obtained where required by local governing authorities.

2 The Contractor shall exercise maximum noise control efforts to minimize the nuisance of construction noise.

***** END OF SECTION *****

SECTION 01600 - MATERIAL AND EQUIPMENT

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Material and equipment for project.

1.02. RELATED SECTIONS:

A Section 01010 - Summary of Work.
B Section 01020 - Products under Allowances.
C Section 01300 - Shop Drawings, Product Data & Samples.
D Section 01700 - Project Closeout.

1.03. MATERIAL AND EQUIPMENT INCORPORATED INTO THE WORK:

A Conform to applicable Specifications and standards.

B Comply with size, make, type and quality specified, or as specifically approved in writing by the Architect Engineer.

C Manufactured and Fabricated Products:

1. Design, fabricate and assemble in accord with the best engineering and shop practices.
2. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
3. Two or more items of the same kind shall be identical, by the same manufacturer.
4. Products shall be suitable for service conditions.
5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

D Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.04. TAKE-OFF AND ORDERING MATERIALS

A The Contractor and/or subcontractors shall take off all items and quantities of all materials, equipment, etc., required and used in the Work and shall be responsible for the correctness of same.

B Place all material orders in sufficient time so that delivery of same is assured at the proper time during progress of the Work in order that no unnecessary delays will be caused during construction.

C Whenever in these Specifications an article, device or piece of equipment is referred to in the singular number, such reference shall include as many such items as are shown on drawings or required to complete the installation.

1.05. TRANSPORTATION AND HANDLING:

A Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with Work and conditions at the site.

1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels and legible.

2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that Products are protected and undamaged.

3. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.06. STORAGE AND PROTECTION:

A Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1 Store products subject to damage by the elements in weather tight enclosures.

2 Maintain temperature and humidity within the ranges required by manufacturer's instructions.

B Exterior Storage.

C Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.

1 Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

D Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

E Protection After Installation:

1 Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.07. ACCESSIBILITY FOR INSPECTION:

A All materials furnished by the Contractor shall be subject to and accessible for inspection and approval by the Architect, or his representative, at any time during the progress of the Work and until final completion thereof. The materials shall be delivered a sufficient length of time in advance of the Work to enable the Architect to make the proper tests and inspection. As soon as materials have been tested and inspected, the Contractor shall

immediately remove all rejected materials from the job site.

1.08. MANUFACTURER'S INSTRUCTIONS:

A When Contract Documents require that installation of work shall comply with manufacturer's printed instruction, obtain and distribute copies of such instructions to parties involved in the installation, including copies to Architect.
1 Maintain one set of complete instructions at the job site during installation and until completion.

B Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
1 Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.
2 Do not proceed with Work without clear instructions.

C Perform Work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.09. OTHER REQUIREMENTS:

A Additional requirements for storage of materials and equipment are called out under the individual specifications headings.

***** END OF SECTION *****

SECTION 01700 - CONTRACT CLOSEOUT

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Clean-up
B Final adjustments
C Maintenance manuals
D Operation instructions
E Record Drawings
F Product and material list
G Warranties
H Substantial completion and final inspection

1.02. RELATED SECTIONS:

A Fiscal provisions, Legal submittals and additional administrative requirements: Conditions of the Contract.
B Section 01300 - Submittals.

1.03. GENERAL

A Comply with all requirements stated in the Conditions of the Contract and in the Specifications for Administrative Procedures in closing of the work.

1.04. CLEANING-UP

A Remove all surplus material, false-work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from operations, and put the site in a neat, orderly condition.

1.05. FINAL ADJUSTMENT

A In conjunction with final cleaning all surfaces and areas, the Contractor shall check all operational pieces of equipment for proper functional operation and alignment. Final adjustments by qualified mechanics shall be made as required.

1.06. MAINTENANCE MANUALS - OPERATION INSTRUCTIONS

A Upon completion of the installation of all work specified, furnish four (4) complete bound copies of operation and maintenance instructions and parts list for all materials, equipment and systems, including electrical and control items, being supplied.

B Operating instructions shall include complete operating sequence, control diagrams, description of method of operating machinery, machine serial numbers, factory order numbers, parts lists, instruction books, supplier's phone numbers and addresses and individual equipment warranties. Parts lists shall be completed in every respect, showing all parts and part numbers for ready reference.

C Assemble maintenance manual and operation instructions in hard back, loose-leaf binders. Suitably labeled, and index all material contained therein for ready reference.

D Upon substantial completion of the project work, submit one (1) copy of the maintenance manual and operating instructions to the Architect for approval. Upon receipt of notice of approval, deliver the additional copies to the Architect.

1.07. RECORD DRAWINGS

A Contractor shall maintain a set of marked drawings at the job site in accordance with the General Conditions. These shall be kept legible and current and shall be available for inspection at all times by the Architect. Show all changes in the contract work, or work added, on these drawings in a contrasting color, and note the date on entry of such change, with change order or field order number applicable.

B Upon substantial completion of the work, transfer the information from the marked drawings at the site to the record drawings, which shall be a complete set of all issued full-sized sheets, regardless of change or lack of change to any particular sheet. Record drawings shall therefore cover all work including: site work, architectural, heating, air-conditioning, plumbing, electrical work and special systems.

C Prepare record drawings on reproducible sepia transparencies which the Contractor shall obtain at the cost of reproduction.

D In showing changes in the work, or added work, use the same legends as were used on the contract drawings. Indicate exact locations by dimensions and exact elevations, given in job datum. Give dimensions from a permanent point of reference. Give elevations of sewer and drainage lines to the invert elevation.

E Electrical record drawings indicate exact routing of all piping, power and control wiring, etc., location and function of all controls and whether manual or automatic, normal amperage readings for all motors taken at the equipment under normal load conditions, final air quantities at each air outlet and at each air return.

F Record changes, additions and/or deletions to the contract drawings shall be made by a draftsman experienced with each major phase of the work, whose lettering and line work shall be equivalent to that used on the contract drawings.

G Record drawings shall contain the names, addresses and phone numbers of the General Contractor and shall be signed by the Contractor, as evidence of his concurrence with the notations, or lack thereof, made on each drawing.

H Upon substantial completion of the project work, submit one bound print set of the record drawings to the Architect for approval. Upon receipt of notice of approval of the record drawings, deliver the record drawings, together with one set of prints, to the Architect.

I Architect shall review the record drawings and he shall be sole judge of the acceptability of

these drawings.

1.08. PRODUCT AND MATERIAL LIST

A Upon substantial completion of the work, submit a complete list of all products and materials incorporated into the work identifying each product and/or material giving supplier's address and telephone number. List shall be arranged in sequence of the specification table of contents.

1.09. WARRANTIES

A Provide all written warranties and certificates required by these specifications, in accordance with the General Conditions. Submit all required warranties to the Architect.

1.10. SUBSTANTIAL COMPLETION

A When Contractor considers the Work is substantially complete, he shall submit to Architect:
1 A written notice that the Work, or designated portion thereof, is substantially complete.
2 A list of items to be completed or corrected.

B Within a reasonable time after receipt or such notice, Architect will make an inspection to determine the status of completion.

C Should Architect determine that the Work is not substantially complete:
1 Architect will promptly notify the Contractor in writing, giving the reasons therefor.
2 Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion to the Architect.
3 Architect will reinspect the Work.

D When Architect concurs that the Work is substantially complete, he will:
1 Prepare a Certificate of Substantial Completion on AIA Form G704, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
2 Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the certificate.

1.11. FINAL INSPECTION

A When Contractor considers the Work is complete, he shall submit written certification that:
1. Contract Documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.

5. Work is completed and ready for final inspection.

A Architect will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

1. Owner will compensate Architect for such additional services.
2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.12. CONTRACTOR'S CLOSEOUT SUBMITTALS TO ARCHITECT

A Evidence of compliance with requirements of governing authorities.

1. Certificate of Occupancy.
2. Certificates of Inspection:
   a. Plumbing Systems.
   b. HVAC Systems.
   c. Electrical Systems.
   d. Security and Alarm Systems.
   e. Others requiring inspection.

B Project Record Documents.
C Operating and Maintenance Data, Instructions to Owner's Personnel.
D Warranties and Bonds.
E Keys and Keying Schedule.
F Spare Parts and Maintenance Materials.
G Evidence of Payment and Release of Liens:
H To requirements of General and Supplementary Conditions.
I Certificate of Insurance for Products and Completed Operations.

1.13. FINAL ADJUSTMENT OF ACCOUNTS

A Submit a final statement of accounting to Architect.
B Statement shall reflect all adjustments to the Contract Sum:

1 The original Contract Sum.
2 Additions and deductions resulting from:
   a Previous Change Orders.
   b Allowances.
   c Unit prices.
   d Deductions for uncorrected Work.
   e Penalties and Bonuses.
   f Deduction for liquidated damages.
   g Deductions for reinspection payments.
   h Other adjustments.
3 Total Contract Sum, as adjusted.

4 Previous payments.
5 Sum remaining due.

C Architect will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.14. FINAL APPLICATION FOR PAYMENT

D Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

***** END OF SECTION *****

DIVISION 2 - SITE WORK

SECTION 02050 - DEMOLITION

PART ONE - GENERAL

1.01. DESCRIPTION

A. WORK INCLUDED: The work covered by this section of specifications includes but is not limited to the following:

Demolish and remove existing structures as shown on plans and noted in the description of work.

Fill holes, open basements, and other hazardous openings with earth free of debris and organic matter.

Remove all existing utility services as shown on plans, called for in the specifications, and uncovered by demolition to the extent and manner satisfactory to the utility companies involved.

Remove all demolition materials and debris from the construction site as soon as practical. Do not permit any accumulation on the site. Transport all demolition materials without spillage on the streets.

Protect, adequately, the construction site, adjoining property, and utility services as work proceeds through all stages.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;

1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 01500 - Requirements for Safety and Special Controls.
3. Section 02200 - Earthwork.

1.02. SUBMITTALS

E Submit required information in accordance with Section 01300.

Submit, to the Architect, a written description of the procedures for demolition, including, but not necessarily limited to:

Protection of Public
Protection of Workers
Demolition Schedule
Disposal of Materials

1.03. QUALITY ASSURANCE:

Comply with pertinent provisions of Section 01400.

1.04. JOB CONDITIONS:
Comply with pertinent provisions of Section 01500.

1.05. DELIVERY, STORAGE AND HANDLING:
Comply with pertinent provisions of Section 01600.

PART TWO - PRODUCTS

NOT USED

PART THREE - EXECUTION

3.01. GENERAL:

A All work shall comply with the requirements of the local building code and accident and fire prevention regulations.

3.02. EXECUTION:

A Contractor's staff responsible for demolitions shall be experienced in this type of work. Equipment is to be of suitable type, in good working condition, and operated by skilled mechanics.
B All work shall be done in a safe and cautious manner, in order to avoid accidents and property damage.
C Protect the work scheduled to remain and, if damaged, repair to match existing work. On remodeling projects, project work scheduled to remain by covering or installing dust-proof partitions as may be required. Cover finished floors scheduled to remain.

3.03. SAFETY:

A Provide protection of persons and property throughout the progress of work. The work shall proceed in a manner as to minimize the spread of dust and flying particles and to provide safe working conditions.
B Furnish and install any necessary barricades to protect the public and workmen during demolition. Barricades to keep the public out of demolition areas shall be left in place until they are not longer needed.
C Provide shoring and bracing required to support and protect work during demolition. Damage to adjoining property shall be the responsibility of the Contractor. Should any damage occur, such facilities or property shall be restored to its original condition at no

additional cost to the Owner.

D Prevent access of unauthorized persons to partly demolished structures. Illuminate and protect dangerous openings as necessary.

3.04. DEMOLITION:

A GENERAL REQUIREMENTS:
1 Strictly observe police and fire prevention code regulations when removing tanks and pipes which may have contained flammable liquids or gases.
2 Report to the Architect any underground voids, chambers, vaults, tanks, etc., discovered during demolition.
3 When demolishing structures against adjoining property, do not disturb support foundations of adjoining property.

B The extent of the demolition is that indicated plus any work also required under the contract.

C Demolition of materials and disposal shall include the tearing down or dismantling of existing construction into small enough components to be removed from the site.

D All demolition items not shown to be salvaged and turned over to the Owner, re-used or relocated shall become the property of the Contractor and shall be removed from the site.

E Prevent accumulation of debris and overloading of any part of the structure.

F DEMOLITION LIMITATIONS:
1 The use of explosives is prohibited.
2 Continuously wet down debris to prevent creation of dust or fire hazards and haul all debris or materials promptly from the site as they accumulate.
3 Streets and walks shall be kept free of debris.

3.05. DISPOSAL OF MATERIALS:

A The removal and disposition of all materials shall be the sole responsibility of the Contractor.

B Burning of combustible materials will not be allowed.

C No material may be sold on the site. No signs shall be placed on the site advertising the sale of materials.

D Disposal of all materials shall be done legally.

3.06. UTILITIES:

A Preserve, in operating condition, unless otherwise indicated, active utilities transverseing the site. Repair damage to such utilities caused by work under this contract to the satisfaction of the owning utility company or agency. Should unknown utilities be encountered during the course of the work, promptly notify the Architect and await instructions for further action. Failure to do so will constitute acceptance of liability for all damage arising from operations subsequent to the discovery of such utilities.

B Arrange with the utility companies for the disconnection of services and removal of fittings and equipment before starting demolition work.

C The Contractor shall be responsible for contacting serving utility companies and requesting exact locations of their respective services.

D Prevent damages to overhead wires, underground cables, telephone, water and sewer lines during demolition operations.

3.07. SALVAGE:

A All salvaged material, unless otherwise noted on plans or in the specifications, shall become the property of the Contractor and shall be evaluated in the Contractor's bid price. Remove promptly salvaged material from the construction site as the work proceeds.

3.08. CLEANING:

A Reduce dust by periodically spraying demolition works with water.

B Remove all demolition materials, debris, and rubbish from the site as soon as practical. Do not permit any accumulation on the site. Transport all demolition materials without spillage on the streets.

C After completion of the demolition work, leave site neat and orderly.

***** END OF SECTION *****

SECTION 02200 - EARTHWORK

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Excavating for footing and foundations.
B Filling and backfilling to attain indicated grades.
C Trenching and trench backfilling.
D Rough and finish grading of the site.
E Furnishing and installing granular cushion under all interior concrete slabs on grade.
F Aggregate base for asphalt paved area.
G Compacted fill under floor slab and footings.

1.02. RELATED SECTIONS:

A Section 01400 - Testing Laboratory Services.
B Section 02010 - Subsurface Conditions.
C Section 02100 - Demolition.
D Section 02500 - Paving and Surfacing.
E Division 15 - Earthwork for Plumbing and Mechanical Systems.
F Division 16 - Earthwork for Electrical System.

1.03. SUBMITTALS:

A Submit information as according to drawings.

1.04. ASSURANCE:

A Testing Agency:
  1 The Owner shall obtain and pay for an independent testing laboratory for all soil compaction tests.

1.05. DELIVERY, STORAGE, AND HANDLING:

A Protection:
  1 Protect all materials from excessive moisture and from contamination by any foreign materials that may affect their performance.
  2 Replace any damaged or contaminated materials to the satisfaction of the Architect.
B Safety:
  1 Safety programs and policies are the responsibility of the Contractor.

1.06. ENVIRONMENTAL REQUIREMENTS:

A Construction shall progress only when weather conditions will not detrimentally affect the quality of finished earthwork.
B Dust Control:
1 Use all possible means to control dust caused by Contractor's operations or resulting from condition of site during non-working hours.
2 Water site areas as necessary to prevent dust from being a nuisance to the public, neighbors and other operations on the site.

PART TWO - - PRODUCTS

2.01. MATERIAL:

A FILL MATERIAL:
1. Approval required: All fill material shall be subject to the approval of the Architect.
2. Notification: For approval of fill material, notify the Architect at least four working days in advance of intention to import material, designate the proposed borrow area.
B ON SITE FILL MATERIAL
1 All on-site fill material shall be soil which is free from organic matter and other deleterious substance.
C GRANULAR CUSHION
1 Granular cushion under interior floor slabs shall be clean mineral aggregate with particle size grading within the following limits:
a Passing the one inch mesh:. 100%
b Passing the number four mesh: Not more than 5%
c Passing the number 200 sieve: Not more than 1%

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Familiarization: Prior to all work of this section, become thoroughly familiar with the site, the site conditions, and all portions of the work falling within this Section.
B Provide line and grade control stakes for all required earthwork construction.
C General Requirements, Earthwork
1 Bids shall be based on the following:
a That the surface elevations are as indicated.
b That no pipes or other artificial obstruction, except those indicated, will

be encountered.

c That the costs for hauling excavated or borrow materials are to be included in the cost of earth excavation.

2 In case the actual conditions differ substantially from those stated or shown, the provisions of the contract respecting an adjustment for changed conditions shall apply, subject to the requirements of notification thereunder being given.

D Unsatisfactory materials which contain vegetable matter, peat, organic clays and silts, sold mulch or rubbish shall not be used as fill or backfill materials.

3.02. INSTALLATION:

A EARTHWORK

1 The earthwork shall conform with the geotechnical soils report that will be prepared after demolition. For bidding purposes, assume removing and replacing with imported engineered fill, 2'-6" below the bottom of the basement level footings. The bottom of all excavations shall be scarified, moisture conditioned and compacted a minimum of 12". All compaction shall be bid as 95% of ASTM D-698. Contractor shall also include the engineering and implementation of shoring required along the existing building footings. Shoring shall be assumed to occur where any excavation extends below the existing footing within a zone of a 45 deg. angle to the bottom of existing footing. Extend earthwork 10'-0" beyond the outside footing line where existing footings do not occur.

B EXCAVATION

1 Remove materials of every nature and description encountered in obtaining indicated lines or grades. Assume that all excavations to indicated lines or grades can be done by hand with hand tools or with power tools.

2 Trim excavation bottoms to required lines, grades.

3 ADDITIONAL EXCAVATION:

a When soil nature is such that good bearing cannot be found at sub-grade levels indicated, Architect may decide that additional excavation to good bearing is necessary. Should Architect so decide, it will be ordered in writing. Such additional excavation, based upon work required between indicated grades and authorized lower grades will be additionally paid for at an established unit price.

4 UNAUTHORIZED EXCAVATION:

a Where existing surface levels are lower than sub-grade levels required for work, where excess or unauthorized excavation takes place beyond indicated lines, grades, fill, no extra cost to Owner, to indicated sub-grades as follows:

(1) Where footings and foundations occur, use concrete fill or same proportions as specified for footing, foundations.

(2) Where slabs occur, use well compacted, clean earth fill.
(3) Penetrate excavations to the contours and dimensions indicated or necessary. Keep excavations free of water during construction. If the Contractor determines it necessary to remove unsuitable material to a depth greater than specified, notify the Owner to evaluate the condition and approve any additional removal of materials. In such event an adjustment in the contract price will be made in accordance with the contract. Refill excavations carried below the depths indicated or directed with soil materials for the specified construction and compact in 6-inch lifts to 95 percent of maximum density determined in accordance with ASTM D1557, Method D. Soil disturbed and weakened by the Contractor's operations or soils permitted to soften from exposure to weather, shall be excavated and replaced with granular material and compacted with a plate type vibratory compactor.

C EXCESS WATER CONTROL:
1 Unfavorable weather: Do not place, spread, or roll and fill material during unfavorable weather conditions. Do not resume operations until moisture content and fill density are satisfactory to the Architect.
2 Flooding: Provide berms or channels to prevent flooding of sub-grade. Promptly remove all water collecting in depression.
3 Softened sub-grade: Were soil has been softened or eroded by flooding or placement during unfavorable weather, remove all damaged areas and re-compact as specified for fill and compaction below.

D GRADING:
1. General: Except as otherwise directed by the Architect, perform all rough and finish grading required to attain the elevations shown on the Drawings.
2. Grading tolerances;
a. Rough grade:
b. Building: Plus or minus 0.1 foot.
c. Finish Grade:
d. Granular cushion under concrete slabs: Plus or minus 0.1 foot.
3. Protection of Surfaces:
a. Newly graded areas shall be protected by approved methods from traffic, erosion and settlement that may occur from any cause prior to acceptance.
b. Additional work to repair or re-establish grades, elevations or slope shall be at the Contractor's expense.
E TRENCHING
1. GENERAL:
a. Perform all trenching required for the installation of items where the trenching is not specifically described in other Sections of these specifications.
b. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of the trench and around the installed item as required for

caulking, joining, backfilling and compacting.
2. Depth: Trench as required to provide the elevations shown on the Drawings. Where elevations are not shown on the Drawings, trench to sufficient depth to give a minimum of 18" of fill above the top of the pipe, measured from the adjacent finished grade, except provide a minimum of 30" cover on asbestos-cement pipe.
3. Correction of faulty grades: Where trench excavation is advertently carried below proper elevations, backfill with material approved by the Architect, and the compact to provide a firm and unyielding sub-grade and/or foundation to the approval of the Architect and at no additional cost to the Owner.

F IN - PLACE COMPACTION
- 1 Compact the approved fill material in place to 95% of maximum density at all footing locations, before placing footings.
- 2 Compaction:
  - a The sub-grade of soils in cut shall have a density of at least 95% of the maximum density determined in accordance with ASTM D1557 to a depth of 12 inches to the minimum 95% density. Fill embankment, and/or backfill under building areas and road areas shall be compacted to not less than 98% of the maximum density; other backfill adjacent to and not supporting any structural elements to at least 90%. If necessary, the Contractor's selected equipment and construction procedure shall be altered, changed or modified in order to meet the specified compaction requirements.

G FILLING
- 1 Fill for building areas and road areas shall be placed in lifts not greater than 6-inches. Each lift shall be compacted as specified herein, before the overlaying lift is placed. If the mixture is excessively moistened by rain, it shall be aerated by means of blade graders, or harrows or if it is excessively dry it shall be moistened until the moisture content of the mixture is satisfactory. The surface of the layer shall be finished by blading or rolling with a smooth roller, or a combination thereof, and shall be smooth and free from waves and inequalities.
- 2 Under floor slabs, sidewalks, stoops and paved areas:
  - a Remove debris and decayable matter.
  - b Scarify top 6" of subgrade, adjust moisture content to near optimum, and compact to 95% of maximum dry density.
  - c Place and compact material in layers not more than 8" thick.
  - d Water and roll each layer with a wabble-wheeled roller or other approved compaction equipment.
  - e Hand tamp edges of fill with an approved mechanical compaction device.
- 3 Compaction: Compact each layer to 95% maximum density at optimum moisture content.
- 4 All other areas:
  - a Remove debris and decayable matter.

b Place and compact material in layers not more than 12" thick.

5 Compaction: Compact material to approximate density of the surrounding existing soil H.

H AGGREGATE BASE FOR PAVED AREAS

1 Check subgrade for conformity with elevations and section immediately before placing aggregate base material.

2 Spread, shape, and compact all aggregate base material deposited on the subgrade during the same day.

3 Compact aggregate base course material to not less than 95% of maximum density.

4 Test density of compacted aggregate base course: ASTM D 2167-66.

5 Conduct one test for each 2500 sq. yds. of in-place material, but in no case not less than one daily for each layer.

I BACKFI LLI NG

1 Do not perform any backfilling operations until work to be covered has received all required inspections and been approved.

2 Building Excavations:

a Placing: Place material in layers not exceeding 8" in thickness and compact each layer before placing next layer.

b Compaction: Compact each layer to 95% maximum density at optimum moisture content. Compaction shall be done with mechanical hand tampers, vibratory roller or other approved compaction equipment.

3 Backfill:

a Promptly backfill excavations as work permits.

b For backfilling, use earth, free from waste, objectional matter; use stone not over 1 /2 cu. ft., do not use frozen material. Place backfill to uniform horizontal layer 12" deep, puddle, tamp or roll as required to make solid.

c Backfill, fill to new surface grades as required. If sufficient sound materials are not on hand to complete filling operations to required grades, furnish same at no extra cost to Owner.

4 Trenches:

a In pipe zone (from bottom of trench to 6" above top of pipe):

b Placing: Place materials simultaneously on both sides of pipe for full width of trench in layers not exceeding 6" in thickness.

c Densification: Thoroughly saturate with water and vibrate with jetting equipment and a concrete vibrator stinger at maximum intervals of 2' along both sides of pipe.

d Above pipe zone: Same as "B" above except place material in 6" layers.

J EXISTING UTILITIES:

1 If any active pipes or other utilities are discovered during excavation, contact Owner immediately for instructions.

2 Remove inactive utilities from within building lines and plug or cap ends as directed.

K TESTING:

1 Density:
   a Minimum number of tests shall be in accordance with Table No. 1. One moisture-density test shall be made in accordance with ASTM D1557 Method D for each type of material. Perform test in accordance with ASTM D1556.

L DISPOSALS
1 Remove excess excavated materials; dispose of legally.

M ACCEPTANCE
1 The acceptance or rejection of the earthwork shall be determined by the results of the conformance and quality control performed as the work commences and progresses for each incremental state or unit of work.

3.03. CLEANING:

***** END OF SECTION *****

SECTION 02280 - SOIL POISONING

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Soil Poisoning for Termite Control.

1.02. RELATED SECTIONS:

A Section 02500 - Soil Sterilization for Weed Control Under Asphalt.

1.03. QUALITY ASSURANCE:

A STANDARDS AND QUALIFICATIONS
1. Chemical soil treatment material and procedures shall comply with current FHA Minimum Property Standards, Publication No. 300, Section 815, with recommendations contained in USDA H & G Bulletin No., 64, Subterranean Termites, Their Prevention and Control in Building, and these Specifications.

1.04. ENVIRONMENTAL REQUIREMENTS:

A ENVIRONMENTAL REQUIREMENTS. Do not apply working solution when soil and fill are frozen or excessively wet, or immediately after heavy rain.
B PROTECTION. Do not disturb treated areas during subsequent construction operation or permit slabs to be placed sooner than 12 hours after soil treatment.
C SCHEDULING:
   1 Begin soil treatment work only after all preparations for slab placement have been completed. Complete treatment prior to placement of vapor barrier under slab on grade.
   2 Begin foundation wall treatment only after footings, foundation walls, and other foundation work, including waterproofing, damp proofing, foundation drainage, and sub-slab plumbing, are complete.
   3 Begin backfill treatment only after backfilling is complete.
   4 Coordinate soil treatment with related work of other trades. If construction in any area is placed before specified treatment is made, provide post-construction treatment at specified rates and absorb the additional expense required by post-construction treatment.

1.05. WARRANTY:

A Upon completion of soil poisoning and as a condition of final acceptance, furnish to the Owner a written warranty providing that:

1 The application was made at the concentration rates and methods in compliance with this specification.
2 The effectiveness of the treatment is warranted for a term of five (5) years without any additional cost to the Owner.
3 Any evidence of subterranean termite activity and/or damage to the structure resulting from such activity within the warranty period will be treated and/or repaired at no cost to the Owner.
4 The warranty shall be drawn in favor of the Owner, successor or assigns.

PART TWO - - PRODUCTS

2.01. ACCEPTABLE MANUFACTURERS:

A Use only a chemical formulated as an emulsifiable concentrate for subsequent dilution with water. Fuel oil will not be permitted as a diluent.

2.02. MATERIAL:

A CHEMICALS
1 Proprietary formulas may be used provided they comply with each of the following:
a Is registered in the State Chemist's Office, and the label shall set forth the names and percent of the active ingredients of the formula. A copy of this registration and formula must be submitted to the Architect for his approval.
b Deliver materials to the job in the original sealed and labeled containers of the manufacturer.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Sufficient notice shall be given to permit application to be made prior to concrete placement. To avoid surface flow of the toxicant from the application site, treatment shall not be made when soil or fill is excessively wet. Apply only after all preparation for slab placement has been completed. There shall be no disturbance of treated areas. Toxicant will be applied not more than 12 hours before placement of concrete.
B Apply no material without notification to the Architect so he may be present during application. Apply during normal working hours in order to be subject to inspection. Permit inspector to sample any and all material used, and to verify the rate of application and volumes.

3.02. INSTALLATION:

A RATE OF APPLICATION
1 The rate of application shall be sufficient to assure the effectiveness of the application.

B METHODS OF APPLICATION
1 Apply toxicant with spray equipment under slabs-on-grade.
2 Apply toxicant with soil injector rod in backfill areas. Insert the rod at 12-inch intervals at a distance not to exceed 6" from the wall. Penetrate the rod to within 6" of the top of the footing.

C TESTING
1 Chemical analysis test may be made of materials used on the basis of one test for each 10,000 square feet of treated areas. Test may be taken of both concentrates and the diluted materials as being applied. See General Requirements for payment for testing.

***** END OF SECTION *****

DIVISION 3 - CONCRETE

SECTION 03300 - CONCRETE CAST IN PLACE

PART ONE -- GENERAL

1.01. SECTION INCLUDES

A Cast in place concrete, complete, in place.

1.02. RELATED SECTIONS

A Section 02200 - Excavation, Backfill and Compaction.
B Section 03100 - Concrete Formwork.
C Section 03200 - Concrete Reinforcement.
D Section 04100 - Masonry Grout.

1.03. REFERENCES

A General: Specifications, standards and publications referenced hereinafter shall be of the issues in effect on date of Invitation to Bid.
  1 Portland Cement: ASTM C150-78a
  2 Aggregates: ASTM C-33-78
  3 Ready-Mixed Concrete: ASTM C-94-78a\
  4 Curing:
    a ASTM C-309-74, Membrane curing
    b ASTM C-17--69, Sheet materials
  5 Admixtures:
    a ASTM C-260-77, Air Entraining
    b ASTM C-494-79, Chemical Admixtures for Concrete
B Sampling and Testing:
  1 Obtaining and testing drilled cores and sawed beams of concrete. Test for Slump of Portland Cement Concrete

1.04. SUBMITTALS

A Submit for review proposed mix design for each class of concrete to be supplied for the project, based on strength specified. Review of mix designs by the Architect will in no way relieve the Contractor of his responsibility for the performance of the concrete.
  1 ASTM C-42-77, ASTM C143-78, ASTM C172-71, ASTM C31-69, ASTM C39-72, Miscellaneous: ACI 306R-78, ACI 305R-77, AC1211.1-77,ACI 304-73,7.

B Test Reports:
  1 Reports of concrete compression, yield, air content, and slump tests.

1.05. QUAUTY ASSURANCE:

A All work under this heading shall conform to the requirements of the' A.C.I. Building Code ACI-318-63" and to the "Design and Control of Concrete Mixtures" published by the Portland Cement Association.

B All concrete shall be in accordance with ACI Standard Recommended Practice for selecting proportions for Concrete (ACI-211) and ACI Standard Recommended Practice for Measuring, Mixing and Placing Concrete (ACI-304).

C Mix and deliver ready mixed concrete in accordance with ASTM C-94.

D Codes: Requirements of the ICBO International Building Code shall govern except as modified herein. Obtain required permits.

E Concrete Proportions: Concrete shall be stone concrete composed of cement, fine aggregate, course aggregate and water.

F Design: The Contractor shall, at his own expense, have an approved, private, independent testing laboratory prepare the designs of mixes for each class of concrete specified to be used. The concrete shall be designed in accordance with ACI Standard Recommended Practice for Design of Concrete Mixes, latest edition, to produce the strength for each type of concrete with the slumps and maximum sizes of course aggregate specified.

G Proportions and Consistency: In accordance with ACl latest edition. Proportions of materials established by the design mix shall have four test specimens for each strength of concrete tested in accordance with ASTM C39 and C31, latest edition. Tests shall produce concrete at least 15% greater than standards shown for the specified classes. No substitution in the materials used on the Work shall be made after the design mix is approved without additional tests in accordance herewith to show that the concrete quality is satisfactory.

H Determination of Strength:

1 Compression tests: During work progress, Contractor shall, at his own expense, have test cylinders made in accordance with ASTM C31, latest edition. Four test cylinders shall be made for each strength of concrete placed on any one day and at least four test cylinders for each 100 cubic yards. All test cylinders shall be laboratory cured. Concrete compression tests shall be made by the same laboratory that designs the concrete mix. Of each group of four test cylinders, two shall be broken at 7 days and two at 28 days, except that the Contractor may, at his option, break one of the two latter test cylinders at 42 days instead.

2 Slump tests: The Contractor shall provide the necessary equipment and tools for making field tests on slump of the concrete. These tests will be made by the Contractor's personnel under the direction of and in the presence of the Owner's representative. The number and time for making these tests will be as directed by the Owner's Representative. Measure slump in accordance with ASTM C143 latest edition.

3 Changes in the Mix: In all cases where 20% of the laboratory control cylinders shown by these tests for any portion of the structure falls below the minimum ultimate compressive strengths specified, the Architect shall have the right to order a change in

mix or in the water content for the remaining portion of the structure. In cases where 10% of the cylinders shown by these tests falls below the required strength, the Architect shall also have the right to require the taking and testing of sample test cores and/or load tests to be made on the portions of the structure so affected. Costs of these tests shall be paid for by the Contractor.

I Qualifications of installers:

1 Throughout the progress of installation of the work of this Section, provide at lease one person who shall thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be present at the site and shall direct all work performed under this Section.

2 In actual installation of the work of this section, use adequate numbers of skilled workmen to ensure installation in strict accordance with the approved design.

3 In acceptance or rejection of work performed under this Section, the Architect will make no allowance for lack of skill on the part of the workmen.

1.06. DELIVERY, STORAGE AND HANDLING

A Cement: Store in weather tight enclosures and protect against dampness, contamination, and warehouse set.

B Aggregates:

1 Stock pile to prevent excessive segregation, or contamination with other materials or other sizes of aggregates.

2 Use only one supply source for each aggregate stock pile.

C Admixtures:

1 Store to prevent contamination, evaporation or damage.

2 Protect liquid admixtures from freezing or harmful temperature ranges.

3 Agitate emulsions prior to use.

1.07. ENVIRONMENTAL REQUIREMENTS

A Weather requirements:

1 Hot weather: When hot weather conditions exist which would seriously impair the quality and strength of concrete, place the concrete as follows:

2 Maintain concrete temperature at time of placement below 90 degrees F. Use chilled mixing water or chopped ice to control concrete temperature, provided the water equivalent of the ice is calculated to the total amount of water.

3 Cover reinforcing steel with water-soaked burlap if the steel becomes too hot. Steel temperature shall not exceed the ambient air temperature immediately prior to placement of concrete.

4 Wet forms thoroughly prior to placement of concrete.

5 Use set-control admixtures in the mix.

6 Do not place concrete during rain.

PART TWO - - PRODUCTS

2.01. MATERIALS

A Concrete: Ready-mixed Concrete, ASTM C 94-78a.
B Compressive strength, maximum water content, and maximum slump and air entrainment shall conform to the following:
C Concrete, unless otherwise specified: Compressive Strength at 28 days - 2500 psi.
D Minimum slump: 3 inches
E Maximum slump: 5 inches
F Air Entrainment: Structural concrete for footings and slabs on grade shall contain air entrainment equal to 4%.
G Cement: ASTM C 150-78a. Type 1 or V.
H Aggregate:
1 Coarse aggregate: Gravel or a mixture of gravel and crushed rock consisting of clean, hard, durable, dense rock fragments or pebbles, free from dust or other coating and practically free from soft, thin, friable, flat, cracked, elongated or laminated pieces. Size and grading shall be as follows:
a Section 8" or thicker, size 467. Sections less than 8" thick, size 67.
2 Fine Aggregate: Sand having sound, clean, hard, dense, durable, uncoated rock grains, free of loam, clay, alkali, salt, ash, lumps, shale, organic or other inferior matter.
3 C-33-54T - Local of proven strength equal to or greater than these requirements will be considered acceptable.
4 Water: Potable
5 Admixtures:
a Literature and laboratory tests of effects on hardened concrete shall be submitted to and approved in writing by the Architect before using any admixtures.
b Self-control admixture shall conform to ASTM-C494, Type D, and shall be incorporated into all concrete used in the project, unless indicated otherwise.
c Liquid curing compounds shall conform to ASTM #-309, Type I, and shall be approved by the Architect.
6 Grout:
a Non-shrink, pre-mixed epoxy grout, Speedcrete or Express Repair.
b Non-shrink grout or dry-pack shall be type required for job indicated.
7 Expansion Joints:
a Expansion, joint filler shall be of the pre-formed non-extruded, resilient type, conforming to ASTM C-1752, Type I.
b Vapor Barrier: Vapor barriers shall be polyethylene sheets having a thickness of 10 mm minimum.

2.02. FABRICATION

A MIXING

1 Mix materials to an uniform consistency in a mixer having positive timing and water control devices. Mixing time after all materials are in the drum shall be not less than one minute for a mixer of one cu. yd. capacity or less, plus fifteen seconds for each cubic yard of mixer capacity in excess of one cubic yard. Retempering: Do not add water at job site without permission of the Architect, and then only to the extent that it will increase slump by 1" maximum. If concrete arrives too stiff for proper placing, take slump tests before and after the permitted addition of water. If slump is increased by more than 1", remove the load from the job. After addition of water, rotate mixer drum a minimum of 20 revolutions at mixing speed before discharge.

2.03. OTHER MATERIALS

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION

A INSPECTION

1. Assure that excavations and form work are completed, and that ice and excess water are removed.
2. Check that reinforcement is secured in place and in correct position.
3. Verify that expansion joint material, anchors, and other embedded items are secured in position.
4. Notify Architect in ample time for inspection of reinforcing steel placement before pouring concrete. Minimum 48 hours.

B TESTING OF CONCRETE:

1 Slump of concrete delivered to the job shall be not less than 3" nor more than 5" unless indicated otherwise. Make slump test in accordance with ASTM C-143 as frequently as directed by Architect. Slump test may be made by the Contractor if the Architect is present during testing, unless specifically stated otherwise within the specifications. The Architect reserves the right to reject a slump test procedure. Make test for 7 day and 28 day strength.

2 Make a test (3-6" x 12" cylinders) for each 40 cubic yards of each class of concrete when placed in large continuous pours or at least one test (l-6" x 12" cylinder) for pours less than 40 cubic yards of each class of concrete.

3 Secure composite samples from the same batch in accordance with ASTM C-172. Mold specimens from each sample in accordance with ASTM C-31 and cure in accordance with ASTM C-31

4 Test cylinders in accordance with ASTM C-39, breaking one cylinder at 7 days, one at 28 days and holding one in reserve. Report all test results to the Architect on the same

day that tests are made.

C Contractor shall pay for all concrete tests performed by an independent testing laboratory.

3.03. INSTALLATION:

A Transporting Concrete:
1 Transport concrete from batching plant to job site in agitator or transit-mix trucks. Discharge all concrete from mixer or agitator within 1 1/2 hours from the time water is added to the batch.

B Placing Concrete:
1 All areas thoroughly cleaned and washed before placing concrete.
2 Concrete shall not be poured into any areas without first receiving an inspection by the Architect. Notice shall be given the Architect 24 hours in advance of intention to pour.
3 Concrete shall not be subjected to any procedure which will cause segregation.
4 Carry on concreting at such a rate that the concrete is at all times plastic and flows readily.
5 No concrete that has partially hardened or been contaminated by foreign material, nor shall retempered concrete be used.
6 Thoroughly compact concrete by suitable means during placing (no jitterbugs shall be used).
7 Thoroughly dampen subgrade 24 hours prior to placing concrete. Lightly dampen immediately before placing concrete.
8 Convey concrete from mixer to final position by method which will prevent separation or loss of material.
9 Maximum height of concrete free fall 5' (12' with elephant trunk).
10 Regulate rate of placement so concrete remains plastic and flows into position.
11 Deposit concrete in continuous operation until panel or section is completed.

C Bonding and grouting: Before depositing new concrete on or against concrete which has set, thoroughly clean and roughen surfaces, removing laitance, loose particles and foreign matter.

D Floor levels: Screed to true levels or slopes, finish tolerance at surface of concrete plus or minus 1 /8" in 10' not to exceed 3/8" plus or minus, over entire area. Mechanical screeds shall be permitted.

E Construction Joints:
1 Clean and roughen surface of concrete, and remove laitance.
2 Wet concrete surface and flush with neat cement grout before placing additional concrete.
3 The use and location of construction joints as indicated. Variation from those indicated shall have prior approval of the Architect.

F Finishing:
1 Strike and level concrete. Do not work surface until ready for floating.
2 Power float surface on disappearance of water sheen. Hand float areas inaccessible to

power float.

3 Use of "jitterbug" or similar equipment not permitted.

4 Exterior concrete slabs: Heavy broom surface just after initial set to produce a non-slip finish. Round edges to 1 /4" radius.

5 Interior concrete slabs: Remove water, laitance and dirt from surface of slabs. Screed to true levels or slopes. Steel trowel to hard, dense surfaces free from trowel marks. Sprinkling of dry cement or mixture of dry cement and sand or surface to absorb moisture or stiffening the mix is not permitted. Avoid excessive troweling. Finish smooth, free from defects and blemishes. Trowel finish steps, etc., unless otherwise indicated. Broom finish all exterior slabs unless otherwise indicated. Broom texture shall be perpendicular to the direction of traffic and shall be accomplished by dragging a stiff bristle broom in one direction only. Use a small radius edger on all edges of exposed work and at construction joints. Variance in concrete slabs shall not exceed 1/8" in 10 feet when checked in any direction with a straightedge. Use a deep cutting scoring tool to mark off walks, etc. All exposed concrete surfaces shall receive a sacked finish smooth and level with all void, pockets, etc., filled.

G Curing and Protection:

1 Protect freshly deposited concrete from premature drying and maintain without drying at a relatively constant temperature for a period of time necessary for the hydration of the cement and proper hardening of the concrete. Curing shall immediately follow the finish operation. Keep concrete continuously moist for at least seven (7) days using one of the following materials or methods.

H Wet Curing:

1 Protect all concrete surfaces from drying out. Begin wet curing as soon as possible without marring the surface of the work. Cover horizontal surfaces with burlap, Kraft paper, or sand, and keep wet. Leave wall forms in place and keep sufficiently wet at all times to prevent opening at the joints and drying of concrete. Continue wet curing for seven (7) days with Type I and Type V cement and three (3) days with Type Ill cement.

I Membrane Curing:

1 If approved by the Architect, membrane curing may as used as an alternate to wet curing specified above. The compound shall be guaranteed not to affect the bond, adhesion, color or effectiveness of floor hardener, resilient floor tile, cement for floor tile, paint, or other surface treatments. Apply compound in accordance with manufacturer's instructions. Concrete shall be in moist condition when curing compound is applied. If forms are removed, wet down before applying compound.

2 When air temperature exceeds 80 degrees F, use fog spray continuously on all concrete surfaces.

J Protection:

1 Rain, Wind and Dust: Protect freshly placed concrete from rain and dust by use of a protective covering. Protect from wind by the use of windbreaks located to prevent rapid drying of the surface.

2 Protect all concrete from damage, heavy shock, materials, construction equipment,

etc.

3 Patch all tie holes, voids, etc., immediately after form removal.

3.04. DEFECTIVE WORK:

A Remove and replace, at own expense, when directed by Architect, slabs which show excessive shrinkage or settlement cracks, and slabs which do not drain properly.

***** END OF SECTION *****

DIVISION 4 - MASONRY

SECTION 04100 - MORTAR AND GROUT

PART ONE - GENERAL

1.01. SECTION INCLUDES

A. Masonry Mortar
B. Masonry Grout

1.02. RELATED SECTIONS

A. Section 04200 - Reinforced Masonry.

1.03. SUBMITTALS

A. Product Data: Submit the following:
1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PART TWO - - PRODUCTS

2.01. MATERIALS

A Cement for mortar and grout shall be Type III Portland Cement conforming to ASTM C-150, standard gray in color unless otherwise noted.
B Aggregate for grout shall conform to ASTM C-448 coarse size No. 8.
C Aggregate for mortar shall conform to ASTM C-144, except that no less than 3% nor more than 10% shall pass a No. 100 sieve.
D Sand for grout shall conform to ASTM C-404, fine aggregate, Size No. 1.
E Hydrated Lime shall conform to ASTM C-207, Type S.
F Mortar shall be freshly prepared and uniformly mixed in ratio one part Portland Cement, 1 /2 part lime, 3/4 parts sand and shall conform to ASTM C-270, Type S.
G Admixture for mortar shall be Omicron Mortarproofing, as manufactured by the Master Builders Company, Cleveland, Ohio. All mortar on project shall contain admixture in strict accordance with manufacturer's printed instructions.
H Water shall be potable.

2.02. OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper

installation.

PART THREE - EXECUTION

3.01. PREPERATION

A Protect all other construction from damage arising from masonry grouting and installation,

3.02. INSTALLATION:

A All work shall be done by skilled craftsmen in this particular field and in a craftsmanlike manner.

B Add sand, cement and mix, then add lime. Mix mortar after all ingredients are added to mixer for at least five minutes or until a thoroughly uniform mix is obtained, whichever period is longer. Adjust consistency of mortar as required. No retempering of mortar will be permitted.

C In hot, dry weather, wet mortar board before loading and cover mortar to retard drying when not in use.

D Use a mortar and grout with 1 1 /2 hours of initial mixing and use no mortar or grout after it has begun to set or after it has become harsh or non-plastic.

E Grout shall be sufficiently fluid to insure complete filling of all sections of masonry requiring grout, but not so thin as to allow segregation of aggregate and shall conform to ASTM C-476. A mix of one part Portland Cement, 21 /2 parts sand and 1' 1 /2 parts aggregate shall be used.

***** END OF SECTION *****

SECTION 04200 - CONCRETE MASONRY UNITS

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Concrete masonry units (CMU's).
B Steel reinforcing bars.
C Masonry-cell insulation.

1.02. RELATED SECTIONS:

1.03. PRECONSTRUCTION TESTING

(b) Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
(i) Concrete Masonry Unit Test: For each type of unit required, according to ASTM C 140 for compressive strength.

(ii) Mortar Test (Property Specification): For each mix required, according to ASTM C 780 for compressive strength.

(iii) Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.

1.04. SUBMITTALS

A Product Data: For each type of product indicated.
B Shop Drawings: For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
C Samples: For each type and color of exposed masonry unit and colored mortar.
D Material Certificates: For each type and size of product indicated. For masonry units include data on material properties, material test reports substantiating compliance with requirements.
E Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
    1 Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C780 for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.

2 Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.04. QUALITY ASSURANCE

A Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

PART TWO - MATERIALS

A MASONRY UNITS, GENERAL

1 Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
2 Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

B CONCRETE MASONRY UNITS

1 Regional Materials: CMUs shall be manufactured within of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within of Project site.
2 Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
3 Integral Water Repellent: Provide units made with liquid polymeric, integral water repellent admixture that does not reduce flexural bond strength where indicated.
4 Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  a ACM Chemistries, Inc.; RainBloc.
  b BASF Aktiengesellschaft; Rheopel Plus.
  c Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
5 CMUs: ASTM C 90.
  a Unit Compressive Strength: Provide units with minimum average net-area compressive strength of: See Contract Drawings
  b Density Classification: See Contract Drawing

C MASONRY LINTELS

1 General: Provide one of the following:
2 Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout.

D MORTAR AND GROUT MATERIALS

1 Regional Materials: Aggregate for mortar and grout shall be extracted, harvested, or recovered, as well as manufactured, within of Project site.
2 Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
3 Hydrated Lime: ASTM C 207, Type S.
4 Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
5 Masonry Cement: ASTM C 91.
6 Mortar Cement: ASTM C 1329.
7 Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.
8 Colored Cement Product: Packaged blend made from portland cement and hydrated lime [masonry cement] [or] [mortar cement] and mortar pigments, all complying with specified requirements, and containing no other ingredients.
9 Aggregate for Mortar: ASTM C 144.
  a For joints less than thick, use aggregate graded with 100 percent passing the sieve.
  b White-Mortar Aggregates: Natural white sand or crushed white stone.
  c Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
10 Aggregate for Grout: ASTM C 404.
11 Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
12 Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs, containing integral water repellent by same manufacturer.
13 Water: Potable.

E REINFORCEMENT

1 Uncoated Steel Reinforcing Bars: ASTM A 615 or ASTM A 996,.
2 Masonry Joint Reinforcement, General: ASTM A 951
  a Interior Walls: Mill galvanized, carbon steel.
  b Exterior Walls: Hot-dip galvanized, carbon steel.

F TIES AND ANCHORS

1 Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
   a Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
   b Steel Sheet, Galvanized after Fabrication: ASTM A 1008, Commercial Steel, with ASTM A 153, Class B coating.

G Steel Plates, Shapes, and Bars: ASTM A 36.

1 Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
2 Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

(d) Anchor Bolts: Headed or L-shaped steel bolts complying with ; with hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/, Class C; of dimensions indicated.

H MISCELLANEOUS MASONRY ACCESSORIES

(a) Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene, urethane or PVC.
(b) Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
(c) Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

I MORTAR AND GROUT MIXES

(a) General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
(i) Do not use calcium chloride in mortar or grout.

(ii) Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is

consistent.
(b) Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
(c) Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.

(i) For masonry below grade or in contact with earth, use Type S.
(ii) For reinforced masonry, use Type S.
(d) Pigmented Mortar: Use colored cement product

(i) Pigments shall not exceed 10 percent of portland cement by weight.
(ii) Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
(iii) Application: Use pigmented mortar for exposed mortar joints with the following units:
1) Decorative CMUs.
2) Pre-faced CMUs.
(e) Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
(i) Application: Use colored aggregate mortar for exposed mortar joints with the following units:
1) Decorative CMUs.
2) Pre-faced CMUs.
(f) Grout for Unit Masonry: Comply with ASTM C 476.
(i) Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
(ii) Proportion grout in accordance with ASTM C 476, for specified 28-day compressive strength indicated, but not less than .
(iii) Provide grout with a slump of as measured according to ASTM C 143.

PART THREE - EXECUTION:

3.01. EXAMINATION

3.02. PREPERATION

3.03. INSTALLATION

A TOLERANCES
1 Dimensions and Locations of Elements:

a For dimensions in cross section or elevation do not vary by more than plus or minus .
b For location of elements in plan do not vary from that indicated by more than plus or minus .
c For location of elements in elevation do not vary from that indicated by more than plus or minus in a story height or total.

2 Lines and Levels:
a For bed joints and top surfaces of bearing walls do not vary from level by more than , or maximum.

3 For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than , , or maximum.

4 For vertical lines and surfaces do not vary from plumb by more than t, , or maximum.

5 For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than , , or maximum.

6 For lines and surfaces do not vary from straight by more than , , or maximum.

7 Joints:
a For bed joints, do not vary from thickness indicated by more than plus or minus , with a maximum thickness limited to .
b For head and collar joints, do not vary from thickness indicated by more than plus or minus .

8 For exposed head joints, do not vary from thickness indicated by more than plus or minus .

B LAYING MASONRY WALLS

1 Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

2 Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3 Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal horizontal face dimensions at corners or jambs.

4 Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

5 Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

6 Where built-in items are to be embedded in cores of hollow masonry units,

place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

7 Fill cores in hollow CMUs with grout under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

C MORTAR BEDDING AND JOINTING

1 Lay hollow CMUs as follows:

a See contract drawings

2 Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3 Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

D MASONRY JOINT REINFORCEMENT

1 General: Install entire length of longitudinal side rods in mortar with a minimum cover of on exterior side of walls, elsewhere. Lap reinforcement a minimum of inches.

2 Space reinforcement per contract drawings

3 Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

E ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

1 Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:

a Provide an open space not less than [] [] [] wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.

b Anchor masonry with anchors embedded in masonry joints and attached to structure.

c Space anchors as indicated on contract drawings.

2 General: Install embedded flashing in masonry at lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

3 Install flashing as follows unless otherwise indicated:

a Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

b At lintels, extend flashing a minimum of into masonry at each end. At heads and sills, extend flashing at ends and turn up not less than to form end dams.

c Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing back from outside face of wall and adhere flexible flashing to top of metal drip edge.

d Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing back from outside face of wall and adhere flexible flashing to top of metal flashing termination.

4 Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

F REINFORCED UNIT MASONRY INSTALLATION

1 Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   a Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   b Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
2 Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
3 Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   a Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

   b Limit height of vertical grout pours as noted on contract drawings.

G FIELD QUALITY CONTROL
1 Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
2 Inspections: Special inspections according to the "International Building Code."

H Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.

I Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

J Place grout only after inspectors have verified proportions of site-prepared grout.

1 Testing Prior to Construction: One set of tests.
2 Testing Frequency: Per contract drawings.
3 Concrete Masonry Unit Test: per contract drawingS
4 Mortar Aggregate Ratio Test (Proportion Specification): per contract drawings
5 Mortar Test (Property Specification): per contract drawings
6 Grout Test (Compressive Strength): per contract drawings

K PARGING

1 Parge exterior faces of below-grade masonry walls, where indicated, in 2 uniform coats to a total thickness of .
2 Use a steel-trowel finish to produce a smooth, flat, dense surface. Form a wash at top of parging and a cove at bottom.
3 Damp-cure parging for at least 24 hours and protect parging until cured.

3.04. CLEANING

A REPAIRING, POINTING, AND CLEANING
1 In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
2 Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
3 Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
4 Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

B MASONRY WASTE DISPOSAL
1 Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
2 Do not dispose of masonry waste as fill within of finished grade.
3 Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

*****END OF SECTION*****

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

PART ONE - GENERAL

1.01. SECTION INCLUDES

A Load-bearing steel stud [exterior] wall framing.
B Non-load-bearing steel stud [exterior] wall framing.
C Steel soffit framing.
D Steel [floor] [and] [ceiling] joist framing..
E Steel stud truss framing.

1.02. RELATED SECTIONS

A Division 01: Administrative, procedural, and temporary work requirements.

1.03. REFERENCES

A American Iron and Steel Institute (AISI) (www.steel.org) - Specification for the Design of Cold-Formed Steel Structural Members.
B American Society of Civil Engineers (ASCE) (www.asce.org) 7 - Minimum Design Loads for Buildings and Other Structures.
C American Welding Society (AWS) (www.aws.org) D1.3/D1.3M - Structural Welding Code - Sheet Steel.
D ASTM International (ASTM)
  1 A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process..
  2 A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
  3 A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
  4 C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
  5 C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
  6 C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
E Steel Stud Manufacturer/s Association (SSMA) (www.ssma.com) - Member Directory.
F Society for Protective Coatings (SSPC) (www.sspc.org) - Painting Manual.

1.04. SUBMITTALS

A Shop Drawings: Indicate framing layout, components, connections, fastenings, and pertinent details.
B Product Data: Indicate framing components, sizes, materials, finishes, and accessories.
C Quality Control Submittals:
  1 Certificates of Compliance: Certificate from Professional Structural Engineer responsible for system design that system was designed in accordance with Contract Document requirements, applicable Building Code, and generally accepted engineering practices.
  2 Welder Certifications: As required by AWS D1.3/D1.3M.

1.05. QUALITY ASSURANCE:

A Manufacturer: Current member of SSMA.
B Installer Qualifications: Minimum [__] years [documented] experience in work of this Section.
C Calculate structural properties of framing members in accordance with AISI Specifications.
D .Design framing under the direct supervision of a Professional Structural Engineer with minimum 2 years experience in the work of this Section and licensed in the State in which the Project is located.
E Design [exterior wall stud system] [roof trusses] to withstand:
  1 Live and dead loads in accordance with Building Code.
  2 Wind pressure loads in accordance with [ASCE 7.] [Building Code.] [____.]
  3 Movement caused by an ambient temperature range of [120] [__] degrees F and a surface temperature range of [160] [__] degrees F.
  4 Maximum deflection under loading: [L/240] [L/360] [L/600] [L/720] [____] without sheathing materials
  5 .Minimum [1/2] [__] inch vertical deflection of structure.
F Design joist system to withstand:
  1 Live and dead loads in accordance with Building Code.
  2 Maximum deflection under loading: [L/240] [L/360] [____] without decking materials.
G Design system to accommodate construction tolerances, deflection of building structural members, and clearances at openings.
H Welder Qualifications: AWS D1.3/D1.3M.

1.06. DELIVERY, STORAGE AND HANDLING

A In accordance with ASTM C1007.

PART TWO - MATERIALS

A MANUFACTURERS
1 Allsteel and Gypsum Products, Inc.
2 Consolidated Fabricators Corp.
3 Craco Manufacturing., Inc.
4 Custom Stud, Inc.
5 Design Shapes in Steel.
6 Frametek Steel Products.

2.01. MATERIALS

A Framing Materials:
1 ASTM A653/A653M or A1003/A1003M, galvanized sheet steel, [G60] [G90] [___] coating class.
2 Fabricate components to ASTM C955.
3 Studs] [and] [joists]: SSMA stud profile, C-shaped, punched for utility access.
4 Tracks:
a SSMA stud track profile, C-shaped, same gage and depth as studs, unpunched.
b Top track: Deflection type, deep leg track with slotted screw holes; permit plus or minus [1/2] [__] inch movement of overhead structure without damage to framing.
c Top and] bottom track: [1-1/4] [__] inch high legs.
d Rim track: Provide closure for ends of joists.

2.02. FABRICATION

A Framing components may be prefabricated using templates.
B Cut members square and with tight fit to adjacent framing.
C Assemble components using screw connection, welding, or clinching methods. Welding to conform to AWS D1.3/D1.3M.
D Fabricate straight, level, and true, without warp or rack.
E Fabrication Tolerances: In accordance with ASTM C955.

2.03. OTHER MATERIALS

A Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.
B Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.
C Fasteners: ASTM C1513; self-drilling, self-tapping screws.
D Touch Up Paint: SSPC Paint 20, Type I or II.
E Welding Electrodes: AWS D1.3/D1.3M; type required for materials being welded.

PART THREE - EXECUTION

3.01 INSTALLATION - GENERAL

A Install framing components in accordance with ASTM C1007, manufacturer's instructions, and approved Shop Drawings.

B Welding: In accordance with AWS D1.3/D1.3M.

C Make provisions for erection stresses. Provide temporary alignment and bracing.

3.02 INSTALLATION - NON-AXIALLY LOADED STUD FRAMING

A Place top and bottom tracks in straight lines with ends butted. Fasten tracks 12 inches on center or as indicated.
B Place studs at spacing indicated and not more than 2 inches from abutting walls and at each side of openings.
C Install deflection compensating top track at framing extending to underside of structure.
D Connect studs to top and bottom tracks.
E Construct corners using minimum of three studs.
F Do not splice studs.
G Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.
H Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.
I Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
J Laterally brace walls at locations indicated.

3.03 INSTALLATION - JOISTS

A Place joists at spacings indicated and not more than 2 inches from abutting walls. Connect members to supports using fastener method.
B Set members parallel and level; install lateral bracing and bridging where indicated.
C Locate joists directly over bearing studs or provide load distribution member.
D Provide additional joists under parallel partitions when partition length exceeds one-half of joist span and around openings that interrupt one or more joists.
E Do not splice joists.
F Provide web stiffeners at reaction points and points of concentrated loads.
G Provide end blocking where joist ends are not otherwise restrained from rotation.

3.04 INSTALLATION TOLERANCES

A In accordance with ASTM C1007.

3.05 FIELD QUALITY CONTROL

A Testing and Inspection Services: Inspect and test shop and field welds in accordance with AWS D1.3/D1.3M.

3.06 ADJUSTING

A Clean and touch up galvanized coatings at welded and abraded surfaces in accordance with ASTM A780.

*****END OF SECTION*****

SECTION 05500 - METAL FABRICATION

PART ONE - GENERAL

1.01. SECTION INCLUDES

A Miscellaneous metal work.
B Anchor Bolts, Expansion Bolts

1.02. REFERENCES

A American Society for Testing Materials (ASTM):

1.03. SUBMITTALS

A Product Data:
  1 Materials list of items proposed to be provided under this Section;
  2 Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
B Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
C Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

PART TWO - PRODUCTS

2.01. MATERIALS

A Comply with following standards, as pertinent:
  1 Steel plates, shapes, and bars: ASTM A36;
  2 Steel plates to be bent or cold-formed: ASTM A283, grade C;
  3 Steel tubing (hot-formed, welded, or seamless): ASTM A501;
  4 Steel bars and bar-size shapes: ASTM A306, grade 65, or ASTM A36;
  5 Cold-finished steel bars: ASTM A108;
  6 Cold-rolled carbon steel sheets: ASTM A336;
B Galvanized carbon steel sheets: ASTM A526, with G90 zinc coating in accordance with ASTM A 525;
  1 Stainless steel sheets: AISI type 302 or 304, 24 gage, with number 4 finish;
  2 Gray iron castings: ASTM A48, class 10;
  3 Malleable iron castings: ASTM A47;
  4 Steel pipe: ASTM A53, grade A, schedule 40, black finish unless otherwise noted;
  5 Concrete inserts:

a Threaded or wedge type galvanized ferrous castings of malleable iron complying with ASTM A27;
b Provide required bolts, shims, and washers, hot-dip galvanized in accordance with ASTM A153.

C FASTENERS
1 General:
a For exterior use and where built into exterior walls, provide zinc-coated fasteners.
b Provide fasteners of type, grade, and class required for the particular use.
2 Comply with following standards as pertinent:
a Bolts and nuts: Provide hexagon-head regular type complying with ASTM A307, grade A;
b Lag bolts: Provide square-head type complying with Fed Spec FF-B-561;
c Machine screws: Provide cadmium plated steel type complying with Fed Sped FF-S-111;
d Washers:
(1) Plain washers: Comply with Fed Spec FF-W-92, round carbon steel;
(2) Lock washers: Comply with Fed Spec FF-W-84, helical spring type carbon steel;
e Toggle bolts: Provide type, class, and style needed but complying with Fed Spec FF-B-588;
f Anchorage devices: Provide expansion shield complying with Fed Spec FF-S-325.

2.02. FABRICATION

A General:
1 In fabricating items which will be exposed to view, limit materials to those which are free from surface blemished, pitting, rolled trade names, and roughness.
2 Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.
3 Fabricate with accurate angles and surfaces which are true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.
4 Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the item.
5 On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish if from the first.
B SHOP PAINT
1 Primer:
2 For repair of galvanizing, use a high zinc-dust content paint complying with

MIL-P-21035.

2.03. OTHER MATERIALS

C Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02. PREPARATION:

A Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.03. INSTALLATION:

A Set work accurately into position, plumb, level, true, and free from rack.
B Anchor firmly into position.
C Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.
D Grind exposed welds smooth, and touch up shop prime coats.
E Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connection.
F Immediately after erection, clean the field welds, bolted connections, and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.

***** END OF SECTION *****

DIVISION 6 - WOOD

SECTION 06100 - ROUGH CARPENTRY

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Framing lumber.
B Nails, bolts, screws, framing anchors and other rough hardware in connection with rough carpentry.
C Plywood Sheathing.

1.02. RELATED SECTIONS:

A Section 05500 - Metal Fabrication.
B Section 06200 - Finish Carpentry.
C Section 06400 - Architectural Woodwork
D Section 09250 - Gypsum Wallboard.
E Section 09900 - Painting.

1.03. SUBMITTALS:

A Certification:
  1 Pressure treated wood: Submit certification by treating plant stating chemicals and process used, net amount of preservative retention and conformance with applicable standards.

1.04. QUALITY ASSURANCE:

A Lumber Grading Rules and Wood Species to be in conformance with Voluntary Product Standard PS 20-70: Grading rules of the following associations apply to materials furnished under this Section.
  1 Western Wood Products Association (WWPA).
B Plywood Grading Rules:
  1 Softwood Plywood - Construction and Industrial: Product Standard PS-1-74.
  2 Grade Marks: Identify all lumber and plywood by official grade mark.
C Lumber: Grade stamp to contain symbol of grading agency, mill number or name, grade of lumber, species or species grouping or combination designation, rules under which graded, where applicable and condition of seasoning at time of manufacturer.

1 S-GRN: Unseasoned.
2 S-Dry: Maximum 19% moisture content.
3 MC-15 or KD: Maximum of 15 % moisture content.
4 Dense.

D Softwood Plywood: Appropriate grade trademark of the American Plywood Association.
1 Type, grade, class, and Identification Index.
2 Inspection and testing agency mark.
3 Testing: ASTM E84-77a, maximum 25 flame spread rating.

E Requirements of Regulatory Agencies:
1 Preservative treated lumber and plywood: American Wood
2 Preservers Bureau, Quality Mark.

F Pressure treated material: American Wood Preservers Bureau Standards.

G Span tables: National Forest Products Association.

H Working stresses: Softwood Lumber, National Design Specification, National Forest Products Association.

1.05. DELIVERY, STORAGE AND HANDLING:

A Immediately upon delivery to job site,. place materials in area protected from weather.

B Store materials a minimum of 6 in. above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation or ventilation.

C Do not store seasoned materials in wet or damp portions of building.

D Protect fire-retardant materials against high humidity and moisture while unloading.

1.06. ENVIRONMENTAL REQUIREMENTS:

A Comply with pertinent provisions of Section 01700.

PART TWO - PRODUCTS

2.01. MATERIALS:

A Lumber:
1 Specified lumber dimensions are nominal.
2 Actual dimensions conform to industry standards established by the American Lumber Standards Committee and the rules writing agencies.
3 Moisture content: Unseasoned or 19% maximum at time of permanent closing in of building or structure, for lumber 2 in. or less nominal thickness.
4 Surfacing: Surface four sides (S4S), unless specified otherwise.
5 End jointed lumber: Structural purposes interchangeable with one-piece lumber.
6 Glued joints of loadbearing lumber: Commercial Standards Cs 253.
7 Framing Lumber, 2 in. to 4 in. thick, 2 in. to 4 in. wide, any commercial softwood species.

8 Light framing:
9 General framing: Standard and Better or Stud Grade.
10 Plates, blocking, bracing, and nailers: Utility grade.
11 Bracing, blocking, bulk headings, and general utility purposes: Economy grade.
12 Studs
  a Loadbearing: Stud, Standard, or No. 3 grade.
  b Nonloadbearing: Utility grade.
13 Structural light framing, 2 in. to 4 in. thick, 2 in. to 4 in. wide: Grade No. 2.
14 Structural joists and planks, 2 in. to 4 in. thick, 6 in. and wider: Grade No. 2.
15 Plywood:
  a Species: Douglas Fir.
  b Wall and Roof sheathing: APA Structural CDX
16 Building Paper: Asphalt-saturated felt: ASTM D 226-77, 15 lb. nonperforated.
17 Preservative Treated Wood and Plywood Products:
  a Preservative: "Cellon" process by the Koppers Company, or approved equal.
  b Application: Pressure treat to a minimum net retention of 0.6 lb. per cubic foot of wood in accordance with AWPA C-28.
  c Redry lumber to a maximum moisture content of 15% after treatment, and stamp "DRY".

B Rough Hardware:
1 Bolts: FS FF-B 584.
2 Nuts: FS FF-N-836.
3 Expansion Shields: FS FF-B-561.
4 Lag screws and bolts: FS FF-B-561.
5 Toggle bolts: FS FF-B-588.
6 Wood screws: FS FF-S-111
7 Nails and staples: FS FF-N-105.
8 Construction Adhesive: Conform with APA Performance Specification AFG-01.

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Examine work of other trades as it affects the work under this section and report to the Architect any conditions unsuitable to receive the work to be done under this section. Arrange for correction of unsatisfactory conditions before proceeding with the work affected.

3.02. PREPERATION:

A INSPECTION:
1 Verify that surfaces to receive rough carpentry materials are prepared to required grades and dimensions.
2 Construct as detailed and in accordance with good carpentry standards to provide for proper support and enclosure.
3 Verify all measurements and dimensions at the job. Rough carpentry shall be self-fitted and nailed and drawn up tight.
4 Lay out, cut, fit and erect blocking and other items of rough carpentry. Do cutting work of carpentry for other trades. Brace, plumb and level all members and secure with sufficient nails (common or smooth box), spikes, and bolts as required by code and to insure rigidity.
5 Provide all wood blocking as indicated or required for a complete job including:
a At toilet accessories.
b At door bumpers.

3.03. INSTALLATION:

A Posts or Columns:
1 Provide two surfaces on posts at right angles to each other for installation of interior finish materials.
2 Built-up posts: Arrange and nail together to accommodate type of construction.
3 Provide mortise in posts to receive tenon connections of girts.
4 Erect posts straight, plumb with straight edge and level, and brace with tack boards at plate and sill.

B Stud Framing:
1 Plates and stud members:
a Provide single bottom plate and double top plates for loadbearing and non-loadbearing partitions, 2 in. thick by width of studs.
b Secure bottom plates to concrete with 1 /2 in. X 10 in. anchor bolts embedded in the structure a minimum of 7 in. and spaces 4 ft. o.c. maximum.
c Provide studs to bottom plate and end nail to lower top plate.
d Toenail studs to bottom plate and end nail to lower top plate.
e Overlap double top plates minimum of 6 in. at corners and intersections
f Face nail upper top plate to lower top plate.
g Nail bottom plate to wood construction.
2 Partition parallel with joists: Locate joists directly below studs.
3 Frame Openings:
a Double studs and headers: Openings less than 4 ft.
b Triple studs and headers: Openings 5 ft. and greater.
4 Headers:
a Continuous headers, same width as studs, depth required to span widest

opening.
b Toenail headers to studs and opening framing.
c Stagger joints in individual header members a minimum of three stud spaces, allowing no joints to cover over openings.
d Lap headers at intersections with bearing partitions or tie with metal straps.

5 Blocking:
a Install in continuous horizontal row at mid-height of single story partitions.
b Wedge, align and anchor blocking with countersunk bolts, washers and nuts, or nails.
c Locate blocking to facilitate installation of finishing materials, fixtures, specialty items and trim..

6 Sheathing:
a Install with face grain horizontal.
b Allow minimum 1/16" space at end joints and 1/8" at edge joints, doubling these spacings in wet or humid conditions.
c Nail 6" o.c. along panel edges and 12" o.c. at intermediate supports with 8d common nails, unless otherwise shown on drawings.

7 Pressure-Treated Wood Products:
a Provide pressure-treated wood for all plates and nailing strips in contact with concrete and in conjunction with gravel stops and built-up roofing.
b Apply two brush coats of same preservative used in original treatment to all sawed or cut surfaces of treated lumber.

C Fastening:
1 Nailing: Use only common wire nails or spikes of the dimension shown on the nailing schedule, except where otherwise called for on the Drawings. For conditions not covered in the Nailing Schedule, provide penetration into the piece receiving the point of not less than 1 /2 the length of the nail or spike provided, however, that 16d nails maybe used to connect two pieces of two inch nominal thickness. Do all nailing without splitting wood. Pre-bore as required. Replace all split members.

D Bolting: Drill holes 1/16" larger in dia. than the bolts being used. Drill straight and true from one side only. Bolt threads shall not bear on wood. Use washers under head and nut where both bear on wood; use washers under all nuts.

E Screws: For lag screws and wood screws, pre-bore holes same diameter as root of thread; enlarge holes to shank dia. for length of shank. Screw, do not drive, all lag screws and wood screws.

F Installation of Building Paper:
1 Install the specified building paper over all exterior framing members where plywood is indicated to be installed, lapping all joints to prevent penetration of water into the stud spaces, and securely fastening the paper in place in accordance with the manufacturer's published recommendations as approved by the Architect.

3.04. CLEANING:

A General: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the Work, free from accumulation of sawdust, cut ends and debris.

***** END OF SECTION *****

SECTION 06200 - FINISH CARPENTRY

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Fitting and installing all wood doors
B Installing all finish hardware

1.02. RELATED SECTIONS:

A Section 06100 - Rough Carpentry.
B 06400 - Architectural Woodwork.
C 08200 - Wood Doors and Frames
D Section 09900 - Painting.
E Work installed under Finish Carpentry but specified in other Sections includes the following:
    1 Section 01500 - Project Sign.

1.03. SUBMITTALS:

A Submit material list for all items specified in this Section with sufficient information to assure compliance with these specifications.

1.04. QUALITY ASSURANCE:

A Finished carpentry shall conform to the requirements of the Architectural Woodwork Institutes Specifications, latest edition.
B Qualifications of Personnel:
    1 Throughout progress of the work .of this section, provide at least one person who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be present at the site and shall direct all work performed under this Section.
    2 In actual installation of the work of this Section, use adequate numbers of skilled workmen to ensure installation in strict accordance with the approved design and the approved recommendations of the materials manufacturers.
C Qualifications of finish hardware adjuster: Provide the services of an AHC member of the Door and Window Institute, or an equally qualified individual approved in advance by the Architect, who shall inspect, adjust and report to the Architect as described in Part Three of this Section.

1.05. DELIVERY, STORAGE AND HANDLING:

A Comply with pertinent provisions of Section 01600.

B Protection:

1 Use all means necessary to protect the materials of this Section before, during and after installation, and to protect the work and materials of all other trades.

2 Protect millwork items against dampness during and after delivery to the site. Store in well ventilated area and where not exposed to extreme change of temperature and humidity.

3 Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART TWO - - PRODUCTS

2.01. MATERIALS:

A Softwood materials shall be kiln dried and graded in accordance with the latest edition of Western Wood Products Association Rules Book and grade stamped by Western Wood Products Association.

B Exterior fiascoes and associated trim shall be "rough sawn" (C or Better) Douglas Fir. Boards shall be "rough sawn" milled to the configurations shown on the Drawings.

C Moldings shall be of Idaho White Pine and of the following patterns and sizes:

1 Base - WP 324 - 11/16" x 2 1/4" Casing - WP 324 - 11/16" x 2 1/4"

D Frames shall be of Idaho White Pine, 11/16" thick flat one-piece jambs for interior openings (finger jointed jambs are acceptable). Widths shall be as shown on the Drawings.

E Miscellaneous solid wood for blocking, furring, nailers, shelving cleats, edge banding and other similar applications shall be Standard or Better, any species.

F Softwood plywood shall meet the requirements of Product Standard PS-1 for softwood plywood, and shall bear the APA trademark of the American Plywood Association.

G Project Sign: Plywood for the project sign shall be MDO EXT-APA plywood, 3/4" thick.

H Soffits: 3/8" thick, kerfed rough sawn 303 siding with shiplapped edges. Grooves are 4" o.c.

I COMPOSITION MATERIALS

1 Particleboard shall meet the requirements of Commercial Standard CS 236, Type 1-B-2, shall have a density of 43 to 45 lbs. per cu. ft., and shall be 3/4", unless otherwise noted or specified.

J FASTENINGS AND ADHESIVES

1 Nails for wood furring shall be high carbon steel masonry nails of the following sizes:

a Furring (3/4" thick) 4d

b Furring (1 1 /2" thick) 16d

2 Nails for exterior wood fascia, joists and trim shall be hot dipped zinc galvanized, stainless steel, or high tensile strength aluminum ring shanked siding nails with blunt, medium channel, or medium needle points and smooth heads and of sufficient length to penetrate bearings a minimum of 1".

3 Miscellaneous fastenings: Screws, toggle bolts, expansion bolts and other miscellaneous fastenings to secure finish carpentry items in place.

4 Adhesives shall be as follows:

K Plastic Laminate: As recommended by plastic laminate manufacturer,

2.02. FABRICATION:

A Closet, utility and storage shelving shall be made of opaque finish, shall conform to the design and details shown on the Drawings, and shall meet the requirements for Economy Grade Closet and Storage Shelving as defined in the Architectural Woodwork Institute Quality Standards, Section 600. Unless otherwise shown on the Drawings, closet and storage shelving shall be as follows:

1 Shelves: Particleboard
2 Vertical Supports: 2 x 2 softwood
3 Framing: 1 x 2 softwood
4 Hookstrips: 1 x 6 softwood
5 Cleats: 1 x 3 softwood.

2.3. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Examine the areas and the conditions under which work of this section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02. PREPERATION:

A Scheduling

1 Do not install finish carpentry materials until exterior doors and windows are in place and until plaster, masonry, or wallboard joint tape is thoroughly dry and the interior of the building is dried out. Do not install composition materials until the building humidity has stabilized.

3.03. INSTALLATION:

A General

1 Employ only mechanics skilled in finish carpentry.

2 In general, woodwork shall be fabricated and assembled at the mills, and be ready for installation when delivered. Erect no woodwork until moisture content of grounds, furring, etc., is below 19% verified by moisture meter.

3 Install all work plumb, level, true to line and firmly secured to grounds or backing. Scribe and fit accurately to adjacent work, taking care not to injure finished surfaces.

4 Distribute defects allowed in the quality grades specified to minimize their effect on the finished work. Fit joints tight, flush and even. Ease all sharp edges.

5 Protect all work after erection, repairing or replacing damaged work as directed.

6 Verify all measurements and dimensions at the job. Finish carpentry work shall be smooth, free from machine or tool marks, abrasions and raised grain on exposed surfaces, machine sanded and hand dressed to a smooth finish.

7 Carefully fit joints, miter exterior angles and cope interior angles. Joints except at end joints, less than 12 feet apart will not be permitted in straight runs in trim members, handrails or moldings. Leave all wood trim and items of millwork free from defects and blemishes.

8 Fastening: Attach all work to assure firm, secure support, with all fastenings concealed. Railing shall be blind nailed where possible; where not possible, locate, drive and set surface nails for putty stopping so as not to be conspicuous in the finish. Surface nail plain casings, base, etc., in pairs at 24' centers. Drill lead holes for all screws. Apply adhesives in strict accordance with manufacturer's directions, supplementing adhesives with nailing as required.

B Installation of Wood Door Bucks.

1 Secure wood door bucks to wood stud walls with three 3/8" diameter bolts per jamb which shall be installed a minimum of 6" into the jamb studs.

C Installation of Wood Moldings and Trims.

1 Set moldings and trim straight, plumb and level, in perfect alignment, and closely fitted together. Joints shall be tight and made in a manner to conceal shrinkage. Nail to bearings at 16" centers. Countersink nails slightly and putty.

D Installation of Miscellaneous Plywood and Soffits

1 Installation of other plywood. Secure plywood to furring, blocking or supports with nails spaced at 6" centers along edges and 12" centers along intermediate supports.

2 Install plywood for soffits with grooves perpendicular to building wall.

E Erection of Project Signs

1 Erect Project Signs as shown on drawing in Section 01500, Temporary Facilities and Controls.

F Installation of Composition Materials

1 Installation of particleboard: Secure particleboard to supports with nails spaced at 6" centers along edges and 12" centers along intermediate supports.

G Installation of Fabricated Items

1 Casework shall be fitted and installed into spaces provided, with trimming and scrubbing neatly and accurately done. Secure walls with screws or toggle bolts.

2 Closet and storage shelving shall be assembled and installed plumb and level. Cleats shall be secured to walls with 6d finish nails through wall into blocking. Countersink

nails and putty.

H Protection:

1 Use all means necessary to protect the materials of this Section before, during and after installation, and to protect the work and materials of all other trades.

2 Protect millwork items against dampness during and after delivery to the site. Store in well ventilated area and where not exposed to extreme change of temperature and humidity.

I Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

***** END OF SECTION *****

SECTION 06400 - ARCHITECTURAL WOODWORK

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Wood cabinets, complete, in place.
B Cabinet hardware, complete, in place.
C Laminated Plastic Tops, Surfaces and Accessories.

1.02. RELATED SECTIONS:

A Section 06100 - Rough Carpentry.
B Section 06200 - Finish Carpentry
C Section 08200 - Wood Doors & Frames
D Section 09900 - Painting.

1.03. SUBMITTALS:

A Shop Drawings:
  1 Submit shop drawings in accord with Section 01300, for all wood cabinets, identified with location, quality grade, type of finish and species of wood.
  2 Show cabinets in related and dimensional position with sections either full size or 3 inches equal 1 foot scale.
  3 The mill shall be responsible for details and dimensions not controlled by job conditions.
  4 Show all required field measurements beyond control of the mill.

1.04. QUALITY ASSURANCE:

A Materials and Fabrication shall conform to the requirements of the "Architectural Woodwork Quality Standards and Guide Specifications" of the Architectural Woodwork Institute, latest edition, as follows:
  1 Solid Wood Members
  2 Plywood and Particleboard
  3 Casework

1.05. DELIVERY, STORAGE AND HANDLING:

A Deliver, store and handle wood cabinets in manner to prevent damage and deterioration.
B Defer delivery to the job until the installation and storage areas are complete and dry of all wet-type construction.

C Maintain relative humidity in storage areas not to exceed 60 percent.
D Protect all surfaces of cabinets subject to damage while in transit. Provide temporary skids under all large or heavy cabinets.

1.06. ENVIRONMENTAL REQUIREMENTS:

A Comply with pertinent provisions of Section 01700.

PART TWO - PRODUCTS

2.01. MATERIALS:

A Cabinet work:
1. Exposed Body Members: Birch or Ash
2. Doors: Same as above, thickness as per Test 400-3.
3. Case Backs: 1 /4" hardboard.
4. Shelves: Same as body members above.
5. Drawer Fronts: Same as body members above.
6. Drawer Bottoms: 1 /4" hardboard.
7. Drawer Sides: 1/2" fir or pine.
8. Plastic Laminates: 1 /16" Formica, Wilsonart, Nevermar, or equal.
9. Counter Tops: 3/4" Particleboard.

B Cabinet Hardware:
1. Hinges: JAYBEE 122-07-01.
2. Drawer Guides: Grant 328, full extension.
3. Adjustable Shelf Standards: K & V 255.
4. Adjustable Shelf Brackets: K & V 256.

2.02. FABRICATION:

A QUALITY GRADE : Materials and fabrication: Custom grade for transparent finish, in accordance with "Quality Standards Illustrated" of the Architectural Woodwork Institute, 1973 Edition, conforming to the following sections:
1. Section 100 - Solid wood members.
2. Section 200 - Plywood and particleboard.
3. Section 400 - Casework.

B Fabrication workmanship: Comply with Section 400 - Casework of the reference standard and 30 degree reverse bevel overlay reveal design as shown in Architectural Woodwork Institute publication, "Architectural Casework Details."
C All edge grain of exposed and semi-exposed plywood and particleboard shall be concealed.
D Assemble all cabinet body members with adhesive.
E Drive all power-driven "T" head nails or staples, where permitted, on exposed surfaces with long dimension parallel to the exposed grain.

F Provide dust panels between drawers.
G Mill Installed Accessories: Install all specified hardware, equipment and special items.

2.03. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A. CONDITION OF SURFACES: Examine all grounds, stripping and blocking to secure cabinets. Do not install until all defects are corrected.

3.02. PREPERATION:

A. FIELD MEASUREMENTS: Take field measurements as required in order to ensure proper fit of cabinet work. Report any major discrepancy between drawings and field dimensions to Architect before beginning fabrication.

3.03. INSTALLATION:

A. Install cabinets plumb to level without distortion.
B. Shim as necessary with concealed shim.
C. Accurately scribe and closely fit all face plates, filler strips and trim strips to irregularities of adjacent surfaces.

***** END OF SECTION *****

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07200 - INSULATION

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A Ceiling Batts
B Wall Batts

1.02. RELATED SECTIONS:

A Section 06100 - Framing and Sheathing.
B Section - Rigid roof insulation
C Section wall insulation

1.03. SUBMITTALS:

A Submit required information in accordance with Section 01300.
B Submit product literature of all materials included in this section.

1.04. QUALITY ASSURANCE:

A Comply with pertinent provisions of Section 01400.
B Requirements of Regulatory Agencies:
1. All work shall conform to the ICBO International Building Code.

1.05. DELIVERY, STORAGE AND HANDLING:

A Coordinate installation with other trades whose work may be affected or have effect.
B Delivery of Materials:
  1 Deliver materials to project site in manufacturer's original packaging.
  2 Clearly identify manufacturer, contents, brand name, applicable standard, and R-value.
C Storage of Materials:
  1 Store materials off ground.
  2 Protect against weather, condensation and damage.
  3 Immediately remove damaged material from site.

1.06. ENVIRONMENTAL REQUIREMENTS:

A Comply with pertinent provisions of Section 01700.

1.07. WARRANTY:

A Comply with pertinent provisions of Section 01500.

PART TWO - PRODUCTS

2.01. MATERIALS:

A Batt Insulation:
- 1 Insulation material shall be flexible mineral wool batts conforming to requirements of NMWIA.
- 2 Material shall have a minimum installed resistance "R" factor as defined by NMWIA of:
  - a R-19 for exterior walls.
  - b R-38 for ceiling.
  - c Other as noted.
- 3 Insulation shall have a flame spread of 25 or less and smoke density rating of 450 or less.
- 4 Sound control batts shall be 4" nominal fiberglass batts. Density of 1.0 lb. with flame spread of 0-25 per ASTM E-84.

B Rigid wall insulation:
- 1 Thickness as indicated.
- 2 R" Value at 1" thickness at 75 degrees F. of 3.9.
- 3 Density I lbs./cu. ft.
- 4 Water vapor transmission perm inches per ASTM C-355
- 5 Water absorption % volume ASTM C-272 - less than 2.0,
- 6 Flame spread rating ASTME-84 less than 25.
- 7 Exterior wall insulation shall be compatable with wall system.

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Examine areas scheduled to receive insulation to ensure protection against inclement weather and other hazards and work of preceding trades is completed.
B Examine space allocated for insulation for proper depth to receive material.
C Proceed with installation only when conditions are satisfactory.

3.02. PREPARATION:

A Remove or protect against projections in construction framing that may damage or prevent proper installation.

B Do not install until such a time as the construction has progressed to the point that inclement weather will not damage or wet the insulation materials.

3.03. INSTALLATION:

A Installation shall be in strict accordance with the manufacturer's printed instructions for the specific product.

B Installation of thermal and sound insulation shall meet the following:
- 1 Fit insulation snugly between framing and nailing strips.
- 2 Maintain integrity of insulation over entire area to be insulated.
- 3 Insulate small areas between closely spaced framing members.
- 4 Carefully cut and fit insulation around pipes, conduits and other obstructions.
- 5 Where pipes or conduit are located in stud spaces, place insulation between exterior wall and pipe, compressing insulation where necessary.
- 6 Do not install insulation requiring compression in excess of 10%.
- 7 Staple facing flanges to sides of wood framing at 8" centers, or closer as necessary to hold flanges tightly to framing members.
- 8 Install insulation with integral vapor barrier toward warm-in-winter side of assembly.

C Installation of loose fill block insulation:
- 1 Fill all un-grouted cells of exterior masonry walls with insulation.
- 2 Proceed with work in conjunction with masonry work so that no un-grouted or uninsulated cells occure.
- 3 Protect the insulation for seeping out any cracks or electrical or other openings by grouting area solid.

***** END OF SECTION *****

SECTION 07500 - MEMBRANE ROOFING

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A Hot mopped Modified Bitumen Mineral Surfaced Roofing.

1.02 RELATED SECTIONS:

A Section 07600 - Flashing and sheet metal.

1.03 SUBMITTALS:

A Product data;
1 Materials list of items proposed to be provided under this Section.
2 Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3 Manufacturer's recommended by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.04 QUALITY ASSURANCE:

A Use a subcontractor approved in writing by the manufacturer of the approved roofing system.
B Cooperate as required in performance of the specified inspecting and testing.

1.05 DELIVERY, STORAGE AND HANDLING:

A Storage of Materials:
1 Stand roll goods on end, and store on a clean floor to keep ends of rolls free from foreign matter.
2 Store roofing materials in a dry place, on raised platforms, and cover with waterproof tarpaulins, inside or in closed vans, protect from the sun and the weather.
3 Store cartons, insulation, and drums of asphalt on raised level platforms, and protect them from weather with waterproof tarpaulins.
4 Store solvents, emulsions, and coatings in a cool, dry area.
5 Keep lids tightly sealed on all emulsions, cut back adhesives, and flashing cements.
6 For 24 hours immediately before laying, stack felt rolls on end and store in an area maintained at a temperature no lower than 50 degrees F.

PART TWO - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A Schuller
B Equal products of other manufacturers.

2.02 MATERIALS: Material specified are Schuller numbers: Roofing system 3 ply mineral surfaced cap sheet system.

A Base layer - 1 layer "GlasBase"
B Intermediate layer - 1 layer "GlasPly"
C Cap Sheet -1 layer "GlasKap FR"

2.03 OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01 EXAMINATION:

A Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
B Do not commence installation of roofing over roof insulating concrete system until substrata are sufficiently dry to receive this installation.
C Prior to start of installation, attend the meeting required under these Specifications, and reach an agreement on procedures to be followed.
D Verify that substrata are dry, smooth, clean, and free from sharp projections and depressions, properly graded to outlets, and that metal fittings are in proper place prior to start of roofing installation.
E Verify that bitumen kettle has a thermometer in good working order.

3.02. INSTALLATION:

A Roofing felts maybe installed either perpendicular or parallel to the roofing incline.
B Installation shall be in accordance with the Manufactures written instructions.

3.03. FIELD QUALITY CONTROL

A During progress of the work of this Section, make visual inspections as necessary, and verify that:

1 All materials used comply with the specified requirements;
2 All materials are properly stored and handled;
3 Bitumen kettles are maintained at proper temperature;
4 Bitumens are applied uniformly, without voids or skips, and in the proper quantity;
5 The proper number and types of plies are installed, with the specified overlaps;
6 The proper number, type, and spacing of fasteners are used;
7 Associated flashings and sheet metal are installed in a timely manner in accordance with the specified requirements;
8 All elements of the work of this Section are completed on the same day and not installed in phases;
9 Insulation, when specified, is properly secured to the substrata, and nailers are provided where and as needed.

B The Owner reserves the right to require test cuts to be made in the installed work of this Section.

***** END OF SECTION *****

SECTION 07600 - FLASHING AND SHEET METAL

PART ONE - - GENERAL

1.01. SECTION INCLUDES:

A All flashing and sheet metal not specifically described in other Sections but required to prevent penetration of water through exterior shell of building.
B Installation of materials specified under this Section that are installed in conjunction with the application of roofing.

1.02. RELATED SECTIONS:

A Section 07900 - Sealants and Caulking.
B Section 09900 - Painting.
C Division 15 - HVAC Sheet Metal Work.

1.03. SUBMITTALS:

A Base drawings on Architect's drawings and details, and show in detail all sheet metal flashing and layout, including location of all joints.

1.04. QUALITY ASSURANCE:

A Qualifications of Manufacturer: Products used in the work of the Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Architect.
B Qualifications of Installers: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
C Install flashing and sheet metal to comply with SMACNA "Architectural Sheet Metal Manual".

1.05. DELIVERY, STORAGE AND HANDLING:

A Comply with pertinent provisions of Section 01600.
B Protection: Use all means necessary to protect materials of this Section before, during and after installation and to protect installed work and materials of all other trades.
C Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART TWO - - PRODUCTS

2.01. MATERIALS:

A Sheet Metal:
1 Thickness or Gauge: 22 ga. unless otherwise shown on the drawings.

B Galvanized Steel:
1 ASTM A 526-71, commercial quality.
2 Coating Designation G90, ASTM A 525-77.
3 Thickness or Gauge: 22 ga. unless otherwise shown on the drawings.

C Fasteners:
1 Nails: Galvanized steel material, flathead, wire, barbed, slating type, FS FF-N-105.
2 Screws: Self-tapping sheet metal type, FS FF-S-107.
3 Rivets: Cadmium plated material, Type and size recommended by sheet metal manufacturers.
4 Bolts: Cadmium plated material, hex head, FS FF-B-575.
5 Nuts: Cadmium plated material, hex head, FS FF-N-836.
6 Solder: ASTM B 32-76; Alloy grade 58, 50% tin, 50% lead.
7 Flux: Raw muriatic acid or an approved commercial brand of soldering flux.
8 Plastic Cement: FS SS-C-153, Type II.

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Verify that substrates are smooth and clean to extent needed for sheet metal work.
B Verify that reglets, nails, cants, and blocking, to receive sheet metal are installed and free of concrete and soil.
C Do not start sheet metal work until conditions are satisfactory.

3.02. PREPERATION:

A Before installing sheet metal verify shaped and dimensions of surface to be covered.

3.03. INSTALLATION:

A Workmanship:
1 Accurately form all work to sizes, shapes and dimensions indicated and detailed, with all angles and lines in true alignment, straight, sharp, erected plumb, level and in proper place, without bulges or waves. Cope or flange intersections to accurately fit

and solder together.

2 Form, fabricate and erect all sheet metal work to perform satisfactorily and to be watertight and weathertight. Turn back all exposed edges and hem 1 /2" wide.

3 Fabricate all items in maximum length; hold all joints to a minimum; and use soldered joints except where expansion joint is required in joint or otherwise indicated.

4 Co-operate with all other trades and arrange for installation of sheet metal in connection with work of other trades. Do all soldering and caulking of joints so formed as may be necessary or required to insure water and weathertight connections.

5 Where projections or supports extend through or attach to the roof surface, furnish flashing collars with 4" high collar and 6" flange all edges. Dimensions of collar shall be large enough to provide 2" clearance around projections. Flanges shall be solid all sides. Slip collar flashing around projection, then solder all joints closed.

6 Provide metal reglets and counter flashings at concrete and/or masonry walls. Install counter flashing under this section, spacing hangers 24" on center and lapping flashings 3" with laps coated with plastic cement. Secure each joint with a union and provide inside and outside ells with the reglet in all angles.

B General:

1 Install all items of sheet metal work as herein described at appropriate locations, unless specified to be installed under another section of these specifications.

2 Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.

3 Hem exposed edges.

4 Angle bottom edges of exposed vertical surfaces to form drips.

C Cleats: Secure to substrate with fasteners space 1 ft. o.c.

D Reglets: Install in accurate locations, straight, in-line, and with leak proof joints.

E Soldering: Clean and flux metals prior to soldering.

F Parapet Caps: See details on the drawings.

G Install in 10 foot maximum lengths with 1 /2 inch space between adjacent lengths.

H Hook drip edge over cleat and secure to wood top plate with two nails at center of length through neoprene washers.

I Provide 4" wide 26 gauge joint covers at all joints secured with two nails into the 1 /2 inch space through neoprene washers. Joint covers shall follow the contour of the parapet cap.

3.04. PROTECTION:

A Use all means necessary to protect materials of this Section before, during and after installation and to protect installed work and materials of all other trades.

3.05. REPLACEMENTS:

A In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.06. CLEANING:

A As work progresses, neutralize excess flux with 5 to 10% washing soda solution, and thoroughly rinse.
B Leave work clean and free of stains, scrap, and debris.
C Clean work of all excess putty, caulking compounds, stains or grease which has been caused by work under this section.

***** END OF SECTION *****

SECTION 07900 - SEALANTS

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Sealants.
B Caulking.

1.02. RELATED SECTIONS:

A Section 08800 - Application of glazing materials.

1.03. SUBMITTALS:

A Manufacturers' Data:
1 Submit a complete materials list showing all items proposed to be furnished and installed under this Section.
2 Sufficient data to demonstrate that all such materials meet or exceed the specified requirements.
3 Specifications, installation instructions, and general recommendations from the materials manufacturers showing procedures under which it is proposed that the materials be installed. Upon approval by the Architect, the proposed installation procedures will become the basis for inspecting and accepting or rejecting actual installation procedures used on the work.

1.04. QUALITY ASSURANCE:

A Qualifications of manufacturers: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Architect.
B Qualifications of installers:
1 Proper caulking and proper installation of sealants require that installers be thoroughly trained and experienced in the necessary skills and thoroughly familiar with the specified requirements.
2 For caulking and installation of sealants throughout the Work, use only personnel who have been specifically trained in such procedures and who are completely familiar with the joint details shown on the Drawings and the installation requirements called for in this Section.

1.05. DELIVERY, STORAGE AND HANDLING:

A Delivery of Materials:

1 Deliver all materials of this Section to the job site in the original unopened containers with all labels intact and legible at time of use. Store only under conditions recommended by the manufacturers. Do not retain on the job site any material which has exceeded the shelf Manufacturers' data.

PART TWO - - PRODUCTS

2.01. MATERIALS:

A Sealants:
1 General: Except as specifically otherwise directed by the Architect, use only the type of sealants described in this Article.
2 Sealant shall be two-component, rubber-based compound conforming to Fed. Spec. TT-S-00227c. Each color and each class of sealant shall be the product of a single manufacturer.
3 Colors:
a Colors for each sealant installation will be selected by the Architect from standard colors normally available from the specified manufacturers. Should such standard color not be available from the approved manufacturer except at additional charge, provide all such colors at no additional cost to the Owner.
b In concealed installations, and in partially or fully exposed installations where so approved by the Architect, standard gray or black sealant may be used.

B Primers:
1 Use only those primers which are non-staining, have been tested for duribility on the surfaces to be sealed, and are specifically recommended for this installation by the manufacturer of the sealant used.

C Backup Materials:
1 General: Use only those backup materials which are specifically recommended for this installation by the manufacturer of the sealant used, and which are nonabsorbent and nonstaining.
2 Acceptable types include:
a Closed-cell reilient urethane or polyvinyl-chloride foam.
b Closed-cell polyethylene foam.
c Closed-cell-sponge of vinyl or rubber.
d Polychloroprene tubes or beads.
e Polyisobutylene extrusions.
f Oil-less dry jute.

D Bond-Preventive Materials:
1 Use only one of the following as best suited for the application and as recommended by the manufacturer of the sealant used.
2 Polyethylene tape, pressure-sensitive adhesive, with the adhesive required only to hold tape to the construction materials as indicated.
3 Aluminum foil conforming to MIL-SPEC-MIL-A-148E.

4 Wax paper conforming to Fed. Spec. UU-P-270.

E Masking Tape:

1 For masking around joints, provide masking tape conforming to Fed. Spec. UU-T-106c.

2.02. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected

3.02. PREPARATION:

A Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the work and materials of all other trades.

B Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

3.03. INSTALLATION:

A INSTALLATION OF BACKUP MATERIAL

1 Use only the backup material recommended by the manufacturer of the sealant and approved by the Architect for the particular installation, compressing the backup material 25% to 50% to secure a positive and secure fit. When using backup of tube or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.

B PRIMING

1 Use only the primer recommended by the manufacturer of the sealant for the particular installation. Apply the primer in strict accordance with the manufacturer's recommendations.

C INSTALLATION OF SEALANTS

1 General: Prior to start of installation in each joint, verify the joint type according to the Details in the Drawings, and verify that the required proportion of width of joints to depth of joint has been secured.

2 Equipment: Apply sealant under pressure with hand or power-actuated gun or other appropriate means. Guns shall have nozzle of proper size and shall provide sufficient

pressure to completely fill joints as designed.

3 Masking: Thoroughly and completely mask all joints where the appearance of sealant on adjacent surfaces would be objectionable.

4 Installation of sealant: Install the sealant in strict accordance with the manufacturer's recommendations as approved by the Architect, thoroughly filling all joints to the recommended depth.

5 Tooling: Tool all joints to the profile shown on the Details in the Drawings.

3.04. CLEANING:

A Remove masking tape immediately after joints have been tooled.

B Clean adjacent surfaces free from sealant as the installation progresses. Use solvent or cleaning agent as recommended by the sealant manufacturer.

***** END OF SECTION *****

DIVISION 8 - DOORS AND WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Hollow Metal Frames.
B Hollow Metal Doors.
C Installation of Finished Hardware.

1.02. RELATED SECTIONS:

A Section 08200 - Wood Doors.
B Section 08700 - Furnishing of door hardware.

1.03. REFERENCES:

A Install all hollow metal work in accordance with NAAM recommendations and as specified.

1.04. SUBMITTALS:

A Shop Drawings:
B Manufactures Literature:

1.05. QUALITY ASSURANCE:

A Comply with pertinate provisions of Section 01400.
B Erector Qualifications: Minimum of two years experience installing stock hollow metal work.
C Reference Standards:
    1 American National Standards Institute (ANSI):
        a ANSI A115, A151.1 - 1969.
    2 American Society for Testing and Materials (ASTM):
        a A 366-72, A 525-77, A 526-71, A 569-72, E 152-76.
    3 Federal Specifications (FS):
        a FS RR-D-575B.
    4 Steel Door Institute (SDI):
        a SDI 100 - 69, 105, 107, 110 - 116.

1.06. DELIVERY, STORAGE AND HANDLING:

:

A Storage of Materials:

1 Upon delivery to the job, store doors and frames in vertical position, raise bottom of doors at least 4" above the floor. Provide wood slats between doors to avoid any metal to metal contact. Leave doors in stored position until ready to hang.

1.07. ENVIRONMENTAL REQUIREMENTS:

A Comply with pertinent provisions of Section 01700.

PART TWO - PRODUCTS

2.01. ACCEPTABLE MANUFACTURERS:

A Hol-o-met Republic Krieger

2.02. MATERIALS:

A Hollow Metal Frames

1 Frames shall be pressed steel to profiles indicated, 16 gauge, cold-rolled in accordance with ASTM A-366. Frames shall be either knocked-down or field assembly, or set up with corners welded and ground smooth.

2 Prepare frames to receive mortared type hardware. Spot weld reinforcing plates to inner surface of jambs at hinge, lock, latch and other hardware locations. Hinge reinforcements shall be 9 gauge steel. All other hardware reinforcements shall be 12 gauge steel. On all frames provide for door closure by reinforcing with 9 gauge concealed steel reinforcing plates. Spot weld 18 gauge galvanized steel plaster guards over suitable reinforcements for surface applied hardware. Do no drilling and tapping at factory for application of surface applied hardware. Punch door stops to receive rubber silencers as required.

3 Provide frames with fixed insert anchors welding to face and flange returns 11" down from top, then 24" on center. Provide frames with floor clips welded to each jamb, face and flanges punched for anchoring to floor. All anchors to be suitable for wall conditions.

4 At door openings wider than 42" and at multiple openings, reinforce head members, full length with 12 gauge steel channel. Brace door frames with temporary wood or metal spreaders to insure maintaining square and true shapes in shipping. Any frames damaged in any way shall not be installed.

5 Provide frames with UL labels as indicated or required.

B Hollow Metal Doors

1 Construct flush type hollow metal doors of 2 sheets of finest grade 18 gauge cold-rooed steel in accordance with ASTM A-366. Vertical stiffeners shall be 20 gauge steel channels, spot welded to each inside face of the door full height and not

more than 6" apart. Reinforce top and bottom of doors horizontally by steel channels, full width, spot welded to each face at least 3" on center. Joints at the edges of doors shall be continuously welded.

2 Doors shall have not less than 3 lbs. rock wool sound deadening materials applied to the interior surface of panels, filling all voids. Sound deadener shall eliminate all metallic reverberations incidental to normal door operation.

3 Provide solid drip cap at top of all exterior outswinging doors.

4 Accurately mortise doors for locks and hinges. Provide adequate reinforcement with steel plates welded to the interior reinforcing channels and drilled and tapped. Provide reinforcement for all other tems of hardware.

5 Doors with glass light openings shall have the openings formed into the face sheets so that no glass frame is required. Recess glazing bead behind the formed opening in the face sheet, beveled and attached without screws.

6 Provide doors with UL labels as indicated or required.

2.03. FABRICATION:

A Priming

1 Prime frames with one shop coat of rust inhibitive primer.

2 Doors shall be bonderized and primed with one shop coat of rust inhibitive primer.

2.04. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. INSTALLATION:

A Install frames at locations indicated, set square and plumb with the building lines, anchoring securely to construction. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface mounted items until finishes have been completed on the substrata.

B Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrata as necessary for proper installation and operation.

C Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

D Cut and fit threshold and floor covers to profile fo door frames with metered corners and hair-line joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.

E At exterior doors, and elsewhere as indicated, set each edge of threshold in a seal strip of sealant as specified.

F Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite-type) if no other recommended. Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

G Install all doors complete with all finish hardware. Install finish hardware in accordance with the hardware schedule and the manufacturer's recommendations. Mount hardware units at heights recommended in NBHA "Recommended Locations for Builders Hardware" unless indicated otherwise, using only mechanics skilled in this type of work.

H Prepare doors at factory for glass lights, grilles and louvers.

***** END OF SECTION *****

SECTION 08120 - FIRE-RATED ALUMINUM FULL VISION DOORS AND FRAMES

PART ONE - GENERAL

1.01 SECTION INCLUDES

A Fire-rated aluminum full vision Aluflam door system including pre-finished door, frame, glazing, and hardware.

1.02 RELATED SECTIONS

A Section 08710 : Door Hardware.
B Section 08817 : Fire-Rated Glass & Framing.

1.03 REFERENCES

A American Society for Testing and Materials (ASTM):
  1 ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.
  2 ASTM E2074 Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
B National Fire Protection Association (NFPA):
  1 NFPA 80: Standard for Fire Doors and Fire Windows.
  2 NFPA 251: Standard Methods of Tests of Fire Endurance of Building Construction and Materials.
  3 NFPA 252: Standard Methods of Fire Tests of Door Assemblies.
C International Building Code (IBC):
  1 IBC-7-2: Methods for Fire Tests of Door Assemblies.
D Underwriters Laboratories, Inc. (UL):
  1 UL 10C: Positive Pressure Fire Tests of Door Assemblies.
E Standard Council of Canada:
  1 ULC Standard CAN4-S104: Fire Tests of Door Assemblies.
F American National Standards Institute (ANSI):
  1 ANSI Z97.1 Safety Glazing Materials Used in Buildings û Safety Performance Specifications and Methods of Test.
G Consumer Product Safety Commission (CPSC):
  1 CPSC 16 CFR 1201 Categories I and II: Safety Standard for Glazing Materials.

1.04 SYSTEM DESCRIPTION

A Performance Requirements:
  1 Fire Rating: 60 minutes.

2 Certification: Doors and frames shall be tested in accordance with ASTM E 2074, NFPA 252, UBC 7-2, UL 10C, CAN4-S104.
3 Testing Laboratory: Fire tests shall be conducted by an approved independent testing laboratory, similar to UnderwriterÆs Laboratories, Inc.

1.05 SUBMITTALS

A Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedure Section.
1 Shop Drawings: Submit shop drawings showing layouts, profiles and product components.
2 Samples: Submit samples for finishes, colors and textures.
3 Technical Information: Submit latest edition of manufacture/s product data providing product description, technical data and installation instructions.

1.06 QUALITY ASSURANCE

A Listings and Labels:
Fire rated framing and glazing shall be under current follow-up services by an approved independent agency and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

1.07 DELIVERY, STORAGE AND HANDLING

A Ordering: Comply with manufacturerÆs ordering instructions and lead-time requirements to avoid construction delays.
B Delivery: Deliver materials to specified destination in manufacturerÆs packaging undamaged, complete with installation instructions.
C Storage and Protection: Store off ground, under cover, protected from weather, direct sunlight, construction activities and at temperature conditions recommended by manufacturer, +10 F to +110 F.
D Handling: Protect materials and finish during handling and installation to prevent damage.

1.08 PROJECT CONDITIONS

A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

PART TWO - PRODUCTS

2.01 FIRE-RATED ALUMINUM FULL VISION DOORS AND FRAMES

A Manufacturer: Aluflam North America

2.02 MATERIALS û ALUMINUM FRAMING

A Frame construction: Integral structure and glazing stops from extruded and thermally broken aluminum profiles. Filled internally with cement composite material.

B Dimensions:
1. Door framing face dimension: 2-⅄ inch
2. Depth of door framing: 3-7/16 inch
3. Door stile face dimension: 3-9/16 inch
4. Door cross rail (if applicable): 3-9/16 inch

C Assembly: Frame corners assembled by means of crimped and bonded miter joints.

D Sealing: Framing system shall insulate against effects of fire, smoke, and heat transfer from either side. Perimeter of the framing system to the rough opening shall be firmly packed with mineral wool insulation.

2.03 MATERIALS - FIRE RESISTANT GLAZING

A Assemblies shall be glazed with [20 minute rated 3/16 inch thick SGG Pyroswiss Extra], [45 minute rated ⅄ inch thick SGG Swissflam 45-N2], [60 minute rated 1 inch thick SGG Contraflam 60-N2], [90 minute rated 1-3/8 inch thick SGG Contraflam 90-N2] fire resistant glazing material as manufactured by Vetrotech Saint-Gobain
   1 Individual lites shall be permanently identified with a listing mark.
   2 Glazing material installed in Hazardous Locations (subject to human impact) shall be certified to meet the applicable requirements for fire rated assemblies referenced in ANSI Z97.1 Standard for Safety Glazing Materials Used In Buildings and/or CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
   3 Visible daylight transmission shall be a minimum of 81%. Glazing material shall be optically clear, colorless and free from unusual distortion.

B Fire-rated glazing shall be insulated with air gap and low-E coated outboard glass lite. Installation conditions shall be analyzed to assure that fire-rated glazing is not exposed to temperatures outside the 10 - 110 degrees F limits.

2.04 MATERIALS - GLAZING AND ASSEMBLY ACCESSORIES

A Fasteners: All fasteners, setting pads, and glazing clips, shall be stainless or zinc-plated steel.

B. Glazing Accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant intumescent glazing tape. Ceramic setting blocks

shall be placed between the metal setting pads and the glazing material. Setting pads and blocks provided by manufacturer.

2.05 FABRICATION

A Door frames and door leaves shall be furnished pre-assembled. Door assemblies shall be field glazed.
B Door assemblies shall be factory prepared for field mounting of hardware.
C Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance (+ - 1/8ö). Obtain approved shop drawings prior to fabrication.

2.06 FINISHES

A Framing shall be chemically cleaned and pretreated, then finished on all exposed areas with:
Anodized Dark Bronze.
B Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C Slight variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.07 DOOR HARDWARE

A Hardware shall be supplied from door manufacturer/s standard recommended hardware groups as specified.

PART THREE - EXECUTION

3.01 EXAMINATION

A. Examine area to receive doors. Openings shall be plumb, square and within allowable tolerances. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Door installation shall be by a specialty contractor with appropriate experience qualifications; and in strict accordance with the approved shop drawings.

3.03 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Glass and frame should be cleaned using soft clean cloth, chamois leathers, sponges or soft paper. Use clean warm water with a mild detergent. Do not use detergent that contains either alkaline, acids or fluoride! Abrasive cleaning methods can damage surfaces! Clean prior to owner/s acceptance. Remove construction debris from project site and legally dispose of debris.

*****END OF SECTION*****

SECTION 08200 - WOOD DOORS AND FRAMES

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Furnishing wood doors
B Furnishing wood door frames
C Wood door frames
D Folding Doors/Partitions

1.02. RELATED SECTIONS:

A Section 06200 - Rough Carpentry.
B Section 08100 - Metal Door Frames.
C Section 08700 - Finish Hardware.
D Section 08800 - Glazing.
E Section 09900 - Painting.

1.03. SUBMITTALS:

A Samples: Submit samples showing face veneers, and finish of doors.
B Shop Drawings:
  1 Show details of door construction:
  2 Frame material and construction
C Door Schedule:
  1. Indicate opening identifying symbol, sizes, door type and grade and show elevation.
D Certificates:
  1 Certificates of compliance with fabrication and test requirements signed by authorized representative of door manufacturing company.

1.04. QUALITY ASSURANCE:

A Acceptable Manufacturers: Qualified to affix each door with National Woodwork Manufacturer's Association (NWMA) Seal of Approval or quality certification stamp.
  1 Panelfold - Folding Doors/Partitions
B Testing Requirements:
  1 Adhesives: NWMA 1.s.1-69
  2 Waterproof bond test for Type I exterior doors.
  3 Water resistant bond test for Type II interior doors.
  4 Allowable Tolerances for Fabrication of Doors:
  5 Size: Plus/Minus 1/16", overall dimensions.
  6 Maximum warp: 1/4"

7 Squareness: Length of diagonal measured on face of door from upper right corner to lower left corner between length of diagonal measured on upper left corner to lower right corner, Maximum difference of 1/4".

8 Prefixing and Prematching for hardware: NWMA Standard Procedures and Recommendations for Factory Machining Architectural Wood Flush Doors for Hardware.

1.05. DELIVERY, STORAGE AND HANDLING:

A Delivery of Materials:

1 Deliver doors to site after plaster and cement are dry and building has reached average prevailing relative humidity of locality.

2. Seal all four edges when delivered to project site.

B Storage of Materials:

1 Stack flat on 2 x 4 lumber, laid 12" from ends and across center.

2 Under bottom door and over top of stack provide plywood or corrugated cardboard to protect door surface.

3 Store doors in area where there will be no great variations in heat, dryness, and humidity.

4 All door frames shall be stored on job site in such a way as to avoid damage. Frames shall be protected after being hung.

1.06. ENVIRONMENTAL REQUIREMENTS:

A Comply with pertinent provisions of Section 01700.

1.07. WARRANTY:

A Guarantee materials and workmanship under conditions of NWMA Standard Door Guarantee. Furnish a two-year written warranty on all doors to Owner at the time of completion of project.

PART TWO - PRODUCTS

2.01. MATERIALS:

A Solid core wood doors:

1 Solid core wood doors shall conform to or exceed U.S. Commercial Standard CS-171, type I. Door Standards: NWMA 1.5.1-69

2 Wood Veneer: Birch or Ash

3 Quality grade: NWMA Good

4 Adhesives: CS 171-58, Type II

5 Core: Glued block.

B Folding Door/Partitions
  1 Manufacturer: Panelfold
  2 Series: "Signature"
  3 Wood veneer

2.02. FABRICATION:

A Moisture Content: 12% maximum at time of fabrication for all wood material.
B Glued block core: Core blocks 2-1 /2" maximum width bonded together, end joints staggered in adjacent rows.
C Bond face panels to core.
D Stile and rail edge bands, 1/2" minimum width, bonded to core.

2.03. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

3.02. PREPERATION:

A Prepare doors at the factory for all grilles, louvers, glass lights, etc.
B Immediately after trimming, reseal edges with material equal to finish material.

3.03. INSTALLATION:

A Hang doors true and plumb with standard bevel and with uniform 3/32 clearance at jambs and head, and bottom clearance of 1 /2" or as required for threshold or carpet clearance. Mortise, drill or otherwise work doors for finish hardware as scheduled, hardware shall be adjusted for proper operation.
B Remove doors and all hardware after fitting finishing.
C After finishing is complete and dry, rehang doors and reinstall hardware
D Finish: All doors shall be finished in accordance with Section 09900.

***** END OF SECTION *****

SECTION 08520 - FIRE-RATED ALUMINUM WINDOWS

PART ONE - GENERAL

1.01 SECTION INCLUDES

A Fire-rated aluminum fixed window including frame and glazing.

1.02 RELATED SECTIONS

A Section 08817 (08 88 17): Fire-Rated Glass & Framing.

1.03 REFERENCES

A American Society for Testing and Materials (ASTM):
  1 ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.
  2 ASTM E2010 Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
  3 ASTM E 283-04, Test Method for Determining Rate of Airflow Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
  4 ASTM E 330-02, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
  5 ASTM E 331-00, Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

B National Fire Protection Association (NFPA):
  1 NFPA 80: Standard for Fire Doors and Fire Windows.
  2 NFPA 257: Standard on Fire Test for Window and Glass Block Assemblies.

C International Building Code (UBC):
  1 UBC-7-4: Methods for Fire Tests of Window Assemblies.

D Underwriters Laboratories, Inc. (UL):
  1 UL 9: Fire Tests of Window Assemblies.
  2 UL 263: Fire Tests of Building Construction and Materials

E Standard Council of Canada:
  1 ULC Standard CAN4-S101: Fire Tests of Building Construction and Materials.
  2 ULC Standard CAN4-S106: Fire Tests of Door Assemblies.

F American National Standards Institute (ANSI):
  1 ANSI Z97.1 Safety Glazing Materials Used in Buildings Safety Performance Specifications and Methods of Test.

G Consumer Product Safety Commission (CPSC):
  1 CPSC 16 CFR 1201 Categories I and II: Safety Standard for Glazing Materials.

H American Architectural Manufacturers Association (AAMA)

1 AAMA 501.1-05, Standard Test Method for Metal Curtain Walls for Water Penetration Using Dynamic Pressure.

1.04 SYSTEM DESCRIPTION

A Performance Requirements:
1 Fire Rating: [60] minutes.
2 Certification: Windows shall be tested in accordance with ASTM E 2010, NFPA 252, UBC 7-4, UL 9, UL263, CAN4-S106.
3 Testing Laboratory: Fire tests shall be conducted by an approved independent testing laboratory, similar to UnderwriterÆs Laboratories, Inc.
4 Air Infiltration: The test specimen shall be tested in accordance with ASTM E283 at a minimum frame size of 97" x 145". Air infiltration rate shall not exceed 0.01 cfm/ft of area at a static air pressure differential of 6.27 psf.
5 Static Water Resistance: The test specimen shall be tested in accordance with ASTM E331 at a minimum frame size of 97" x 145". There shall be no leakage as defined in test method at a static pressure differential of 10 psf.
6 Dynamic Water Resistance: The test specimen shall be tested in accordance with AAMA 501.1 at a minimum frame size of 97" x 145". There shall be no leakage as defined in test method at a dynamic pressure differential of 10 psf.
7 Uniform Load Deflection: A minimum static air pressure difference of 60 psf shall be applied in the positive and negative direction in accordance with ASTM E330. There shall be no deflection in excess of L/175 of the span of any framing member.
8 Uniform Load Structural Test: A minimum static air pressure difference of 90 psf shall be applied in the positive and negative direction in accordance with ASTM E330.
9 Thermal Transmittance (U-value): When tested to AAMA Specification 503.1, the thermal transmittance (U-value) shall not be more than 0.48 BTU/hr/sf/?F.

1.05 SUBMITTALS

A Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedure Section.
1 Shop Drawings: Submit shop drawings showing layouts, profiles and product components.
2 Samples: Submit samples for finishes, colors and textures.
3 Technical Information: Submit latest edition of manufacturerÆs product data providing product description, technical data and installation instructions.

1.06 QUALITY ASSURANCE

A Listings and Labels:

1 Fire rated framing and glazing shall be under current follow-up services by an approved independent agency and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

1.07 DELIVERY, STORAGE AND HANDLING

A Ordering: Comply with manufacturerÆs ordering instructions and lead-time requirements to avoid construction delays.
B Delivery: Deliver materials to specified destination in manufacturerÆs packaging undamaged, complete with installation instructions.
C Storage and Protection: Store off ground, under cover, protected from weather, direct sunlight, construction activities and at temperature conditions recommended by manufacturer, +10 F to +110 F.
D Handling: Protect materials and finish during handling and installation to prevent damage.

1.08 PROJECT CONDITIONS

A Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

PART TWO - PRODUCTS

2.01. FIRE-RATED ALUMINUM FIXED WINDOWS

A Manufacturer: Aluflam North America

2.02 ALUMINUM FRAMING

A Frame construction: Integral structure and glazing stops from extruded and thermally broken aluminum profiles. Filled internally with cement composite material.
B Dimensions:
1 Perimeter framing face dimension: 2- inch
2 Depth of framing: 3-7/16 inch
3 Cross rail (if applicable): 3-9/16 inch
C Assembly: Frame corners assembled by means of crimped and bonded miter joints.
D Sealing: Framing system shall insulate against effects of fire, smoke, and heat transfer from either side.
E Perimeter of the framing system to the rough opening shall be firmly packed with mineral wool insulation.

2.03 FIRE RESISTANT GLAZING

A Assemblies shall be glazed with 60 minute rated 1 inch thick SGG Contraflam 60-N2 fire resistant glazing material as manufactured by Vetrotech Saint-Gobain
   1 Individual lites shall be permanently identified with a listing mark.
   2 Glazing material installed in Hazardous Locationsö (subject to human impact) shall be certified to meet the applicable requirements for fire rated assemblies referenced in ANSI Z97.1 Standard for Safety Glazing Materials Used In Buildings and/or CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
      a Visible daylight transmission shall be a minimum of 81%. Glazing material shall be optically clear, colorless and free from unusual distortion.
      b Fire-rated glazing shall be insulated with ¾ö airgap and ¾ö low-E coated outboard glass lite. Installation conditions shall be analyzed to assure that fire-rated glazing is not exposed to temperatures outside the 10 - 110 degrees F limits.

2.04 GLAZING AND ASSEMBLY ACCESSORIES

A Fasteners: All fasteners, setting pads, and glazing clips, shall be stainless or zinc-plated steel.
B Glazing Accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant intumescent glazing tape. Ceramic setting blocks shall be placed between the metal setting pads and the glazing material. Setting pads and blocks provided by manufacturer.

2.05 FABRICATION

A Window frames shall be furnished pre-assembled. Window assemblies shall be field glazed.
B Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance (+ - 1/8ö). Obtain approved shop drawings prior to fabrication.

2.06 FINISHES

A Framing shall be chemically cleaned and pretreated, then finished on all exposed areas with:
   1 Anodized Dark Bronze
B Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C Slight variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

PART 3 - EXECUTION

3.01 EXAMINATION

A Examine area to receive windows. Openings shall be plumb, square and within allowable tolerances. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A Window installation shall be by a specialty contractor with appropriate experience qualifications; and in strict accordance with the approved shop drawings.

3.03 CLEANING

A Cleaning: Remove temporary coverings and protection of adjacent work areas. Glass and frame should be cleaned using soft clean cloth, chamois leathers, sponges or soft paper. Use clean warm water with a mild detergent. Do not use detergent that contains either alkaline, acids or fluoride! Abrasive cleaning methods can damage surfaces! Clean prior to owner/s acceptance. Remove construction debris from project site and legally dispose of debris.

*****END OF SECTION*****

DIVISION 9 - FINISHES

SECTION 09200 - EFIS FINISH SYSTEM

PART ONE - GENERAL

1.01 SECTION INCLUDES:

A Dryvit Commercial Cement Plaster 5 Data Sheet, DS816.
B Dryvit Commercial Cement Plaster 5 Installation Details, DS828.
C Dryvit Commercial Cement Plaster Base û Sanded DS817
D Dryvit Commercial Cement Plaster Base û Concentrate DS818

1.02 RELATED SECTIONS

A Section 01200 - Project Meetings
B Section 03300 - Concrete
C Section 04220 - Unit Masonry
D Section 05410 - Load-Bearing Steel Studs
E Section 06110 - Wood Framing
F Section 07600 - Flashing and Sheet Metal
G Section 07900 - Joint Sealants
H Section 09110 - Non Load-Bearing Steel Studs
I Section 09250 - Gypsum Sheathing Board

1.03. REFERENCES

A International Building Codes (IBC)
B American Concrete Institute ACI 524R: Guide to Portland Cement Plastering
C Portland Cement Association: Portland Cement Plaster (Stucco) Manual
D ASTM A 526: Steel Sheet, Hot-Dip Galvanized, Commercial Quality
E ASTM C 150: Standard Specification for Portland Cement
F ASTM C 754: Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
G ASTM C 847: Standard Specification for Metal Lath
H ASTM C 897: Standard Specification for Aggregate for Job Mixed Portland Cement Based Plasters
I ASTM C 920 Standard Specification for Elastomeric Joint Sealants
J ASTM C 926: Standard Specification for Application of Portland Cement-Based Plaster
K ASTM C 933: Standard Specification for Welded Wire Lath
L ASTM C 1007: Standard Specification for Installation of Load Bearing (Transverse and axial) Steel Studs and Related Accessories.
M ASTM C 1032: Standard Specification for Woven Wire Plaster Base

N ASTM C 1063: Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
O ASTM C 1328: Standard Specification for Plastic (Stucco) Cement
P ASTM D 226: Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Waterproofing
Q ASTM D 4258: Standard Practice for Surface Cleaning Concrete for Coating
R ASTM D 4259: Standard Practice for Abrading Concrete
S ASTM D 4260: Standard Practice for Acid Etching Concrete
T ASTM D 4261: Standard Practice for Surface Cleaning Concrete Masonry Units for Coating
U ASTM D 1784: Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
V ICC-ES AC11: Cementitious Exterior Wall Coatings

1.04 SUBMITTALS

A Submittal requirements by the contractor are to be indicated in the construction documents as required, including:
1 Product literature, samples or mock up.
2 Finish sample indicating color and texture for approval by architect/owner.

1.05 DESCRIPTION

A Commercial Cement Plaster 5 consists of Dryvit Backstop NT air/water-resistive barrier, Dryvit CCP Base - Sanded or Concentrate*, Dryvit leveling coat and Reinforcing Mesh, Dryvit acrylic primer and Dryvit acrylic coating or finish. CCP Base is applied directly to the properly installed paper backed metal lath (as specified) over a furred rainscreen, drained cavity.
B Design Requirements:
a. Substrates shall comply with local code requirements and practices for use under cement plaster and shall be wood or metal framed wall assemblies sheathed with approved substrates as follows:
1. Exterior grade gypsum sheathing meeting ASTM C 1396 (formerly C 79) requirements for water resistant core or Type X core.
2. Exterior sheathing having a water-resistant core with fiberglass mat facers meeting ASTM C 1177.
3. Exterior fiber reinforced cement or calcium silicate boards.
4. APA Exterior or Exposure 1 Rated Plywood, Grade C-D or better, nominal 12.7 mm (1/2 in) minimum 4-ply.
5. Exterior grade fire retardant treated (FRT) plywood.
6. APA Exposure 1 Rated Oriented Strand Board (OSB) nominal 11.1 mm (7/16 in) minimum
b. The roofing materials shall be loaded onto the roof and interior wallboard stocked in the building prior to the installation of the Commercial Cement Plaster 5.

c. Deflection of substrate systems shall not exceed L/360.
d. The slope of inclined surfaces shall not be less than 6:12.
e. The length of inclined surfaces shall not exceed 305 mm (12 in).
f. Slopes on windowsills projecting 102 mm (4 in) or less, shall not be less than 3:12.
g. Expansion joints:
1) Design and location of expansion joints shall be determined by the project design professional and indicated on the contract documents. As a minimum, expansion joints in Commercial Cement Plaster 5 are required at the following locations:
a) Where expansion joints occur in the substrate system.
b) Where building expansion joints occur.
c) At floor lines in wood frame construction.
d) Where Commercial Cement Plaster 5 abuts dissimilar materials.
e) Where the substrate changes.
f) Where significant structural movement occurs such as changes in roofline, building shape or structural system.
h. Control joints:
1) Design and location of control joints shall be determined by the project design professional in accordance with ASTM C 1063 and indicated on the contract drawings. As a minimum, control joints shall be located at the following locations:
a) Corners of openings
b) Such that monolithic wall areas do not exceed 13.4 m2 (144 ft2)
c) Length to width ratios of wall areas shall not exceed 2.5:1.
d) Maximum spacing of control joints shall not exceed 5.5 m (18 ft)
i. Sealants
1) Refer to Section 07900
2) Shall meet ASTM C 920
3) Use, type and location of sealants is the responsibility of the project designer and shall be indicated on the contract documents.
4) Refer to Dryvit publication DS153 for a list of sealants that have been tested for compatibility with Dryvit products.
j. Vapor Retarders
1) Use and location of vapor retarders within a wall assembly is the responsibility of the project designer and shall comply with local building code requirements. Type and location shall be noted on the contract documents. Vapor retarders may be inappropriate in certain areas and can result in condensation within the wall assembly when incorrectly used. Refer to Dryvit publication DS159 for additional information.
k. Flashing shall be provided at all roof-wall intersections, windows, doors, chimneys, decks, balconies, and other areas as necessary to prevent water penetration behind Commercial Cement Plaster 5.

C Testing referenced is based on Quarzputz Pastel Base.

D Finish applied over aluminum panels, bent on cylindrical mandrels as described in ASTM D 522 Method B. Lower diameter indicates higher flexibility.

E No cracking, checking, rusting, crazing, erosion, blistering, peeling, or delamination when

viewed under 5x magnification.

F Delta E is total color difference, including yellowing, lightening, darkening, changes in red, blue, and green color values. Finish exposed to 5,000 hours of QUV prior to evaluating Delta E.

1.06 QUALITY ASSURANCE

A Qualifications:
- 1 Manufacturer: Shall be Dryvit Systems, Inc. or approved suppliers. All materials shall be obtained from Dryvit Systems, Inc. or its authorized distributors.
- 2 Plastering Contractor:
  - a Shall be knowledgeable in the proper installation of exterior lathing and cement plaster products.
  - b Shall have qualified and properly trained people to perform work.
  - c Shall be licensed, bonded and insured.
  - d Shall have experience in application of cement plaster products on projects of comparable scope.

B Mock-Up
- 1 The contractor shall, before the project commences, provide the owner/architect with a mock-up for approval.
- 2 The mock-up shall be of suitable size as required to accurately represent each color and texture to be utilized on the project.
- 3 The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual applications. The finish used shall be from the same batch as that being used for the project.
- 4 The approved mock-up shall be available and maintained at the job site.

1.07 DELIVERY, STORAGE AND HANDLING

A All Commercial Cement Plaster 5 materials shall be delivered to the job site in the original, unopened packages with labels intact. Questionable materials shall not be used.

B Minimum storage temperature shall be 7 C (45 F) for Color Prime-WÖ, 10 C (50 F) for Ameristone, and 4 C (40 F) for other products.

C All materials shall be stored above ground, dry and protected.

D Protect all products from weather and direct sunlight.

1.08 PROJECT CONDITIONS

A Application of materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are dry.

B Base shall not be applied when wall or ambient temperatures are below 4 C (40 F).

C Application Primer and Finishes shall be at a minimum ambient temperature of 4 C (40 F), 7 C (45 F), or 10 C (50 F), These temperatures shall be maintained for a

minimum of 24 hours thereafter, or until completely dry. Refer to the product data sheet(s) for the specific product specified. CCP Base shall be completely dry and properly cured for a minimum of 7 days prior to primer application.

D If necessary, tenting, heating and ventilation may be utilized to maintain required conditions. Heaters shall be vented to the outside.

E Protect the Commercial Cement Plaster 5 materials from uneven and excessive evaporation in dry, warm, or windy weather. Always work the shady side of the wall.

1.09 SEQUENCING AND SCHEDULING

A Installation of the Commercial Cement Plaster 5 shall be coordinated with other construction trades.

1.10 WARRANTY

B Provide a limited warranty defective material.

1.11 MAINTENANCE

PART TWO - PRODUCTS

2.01 MANUFACTURER:

A All components of Commercial Cement Plaster 5 shall be obtained from Dryvit or its authorized distributors.

2.02 MATERIALS

A Air/Water Resistive Barrier components:
1 Dryvit Backstop NT: A flexible, polymer-based non cementitious air and water resistive barrier coating
2 Dryvit Grid TapeÖ: An open weave fiberglass mesh tape with pressure sensitive adhesive available in rolls 102 mm (4 in) wide by 91 m (100 yds) long.

B Cavity furring (by others) shall be installed vertically to provide a minimum 12.7 mm (1/2 in) clear space and be:
1 Preservative treated wood strapping spaced maximum 406 mm (16 in) on-center.
2 Galvanized metal spaced maximum 406 mm (16 in) on-center.

C Sheathing Backer (by others): Shall provide adequate support for the application of the lath and CCP Base. and shall be one of the approved substrates as noted in 1.05.1.a or:
1 Breather Board: A 3-ply semi-rigid asphaltic board made up of a button-punched fiberglass sheet coated with high-melt asphalt, then faced on each side with asphalt-Kraft building paper.

D Paper Backed Metal Lath (by others): Specific type to be selected by designer based on

specific project requirements.

1 Self-Furring Diamond Mesh metal lath shall be galvanized, minimum 1.4 kg/m2 (2.5 lbs/sq yd) or 1.9 kg/m2 (3.4 lbs/yd2) and comply with ASTM C 847.

2 Self furring welded wire lath, minimum 16 gauge, shall be galvanized with openings not exceeding 51 mm x 51 mm (2 in x 2 in), and comply with ASTM C 933.

3 9.5 mm (3/8 in) galvanized rib lath shall comply with ASTM C 847.

4 Self furring woven wire lath, minimum 17 gauge, shall be galvanized with openings not exceeding 38 mm x 38 mm (1 1/2 in x 1 1/2 in) meeting ASTM C 1032.

E Accessories

1 Type, style and manufacturer shall be indicated on construction documents.

2 Depth of accessories (grounds) shall be sized for the plaster thickness.

3 In corrosive environments, accessories manufactured of PVC or zinc are recommended.

4 Steel accessories shall meet ASTM C 841.

5 PVC accessories shall meet ASTM D 1784 and ASTM C 1063.

F Plaster Base Coat:

1 Dryvit CCP Base - Sanded: A fiberglass reinforced, cement plaster mix utilizing alkali resistant fibers and proprietary cementitious admixtures which is field mixed with water and Dryvit AC-100 activator (when specified). CCP Base - Sanded is packaged in 36.3 kg (80 lb) bags.

2 Dryvit CCP Base - Concentrate: A fiberglass reinforced, cement plaster mix utilizing alkali resistant fibers and proprietary cementitious admixtures which is field mixed with clean, graded plaster sand meeting ASTM C 897, water and Dryvit AC-100 activator (when specified). CCP Base - Concentrate is packaged in 36.3 kg (80 lb) bags.

G Fiberglass Reinforced Base Coat

1 Dryvit Genesis«: A fiber reinforced, 100% acrylic-based product which is field mixed with Portland cement.

2 Dryvit Genesis DM: A fiber reinforced, dry-blend, cementitious product which is field mixed with water.

3 Dryvit Standard reinforcing mesh: A balanced open weave, glass fiber fabric treated for compatibility with Commercial Cement Plaster 5 components.

a Shall be colored blue for identification bearing the Dryvit logo.

H Primer:

1 Dryvit Color PrimeÖ, Color Prime-W or Primer with SandÖ: A water-based, pigmented acrylic primer applied over the cured CCP base coat to improve adhesion and provide a more uniform appearance of the finish.

I Dryvit Coating:

1 Demandit« - integrally colored smooth exterior wall coating enhanced with proven mildew resistance. A minimum of 2 coats are required.

2 Weatherlastic« Smooth - integrally colored, elastomeric, smooth exterior wall coating enhanced with proven mildew resistance. A minimum of 2 coats are required.

J Dryvit Finish(es): 100% acrylic finishes with integral color and texture. Shall be the type,

color and texture as selected by the architect/owner and shall be of the following types:

1 Standard DPR (Dirt Pickup Resistance): Water-based, acrylic coating with integral color and texture and formulated with DPR chemistry:
   a Quarzputz« DPR: Open-texture
   b Sandblast« DPR: Medium texture
   c Freestyle« DPR: Fine texture
   d Sandpebble« DPR: Pebble texture
   e Sandpebble« Fine DPR: Fine pebble texture
2 Water-based, lightweight acrylic coating with integral color and texture and formulated with DPR chemistry:
   a Quarzputz« E
   b Sandpebble« E
   c Sandpebble« Fine E
3 FM: Water-based, acrylic coating with integral color and texture, formulated with PMR chemistry:
   a Sandpebble« FM
   b Sandpebble« Fine FM
4 Specialty: Factory mixed, water-based acrylic:
   a Ameristone: Multi-colored quartz aggregate with a flamed granite appearance.
   b Stone Mist«: Ceramically colored quartz aggregate.
   c Custom BrickÖ: Acrylic polymer-based finish used in conjunction with a proprietary template system to create the look of stone, brick, slate or tile.
   d TerraNeo«: 100% acrylic-based finish with large mica chips and multi-colored quartz aggregates.
   e LymestoneÖ: A premixed, 100% acrylic-based finish designed to replicate the appearance of limestone blocks.
   f ReflectitÖ: 100% acrylic coating providing a pearlescent appearance.
5 Elastomeric DPR (Dirt Pickup Resistance): Water- based, elastomeric acrylic coating with integral color and texture and formulated with DPR chemistry:
   a Weatherlastic« Quarzputz
   b Weatherlastic« Sandpebble
   c Weatherlastic« Sandpebble Fine
   d Weatherlastic« Adobe
6 Medallion Series PMRÖ (Proven Mildew Resistance): Water-based, acrylic coating with integral color and texture and formulated with PMR chemistry:
   a Quarzputz« PMR
   b Sandblast« PMR
   c Freestyle« PMR
   d Sandpebble« PMR
   e Sandpebble« Fine PMR
7 Coatings, Primers and Sealers:
   a Demandit
   b Weatherlastic« Smoot

c Tuscan GlazeÖ
d Revyvit«
e Color Prime
f Prymit
g SealClearÖ

8 Silicone Enhanced: All coatings and finishes are available in Silicone Enhanced (Si) versions.

9 Enhanced Hydrophobic (HDPÖ) Coatings/Finishes: Sandpebble, Sandpebble Fine and Demandit are available in HDP versions.

PART THREE - EXECUTION

3.01 EXAMINATION

A Prior to installation of Commercial Cement Plaster 5, it is the contractor/s responsibility to ensure that:

1 The surfaces to receive plaster are free of dust, loose particles, oil and other conditions that would affect the adhesion, installation or performance of Commercial Cement Plaster 5 materials.

2 The lath is of the proper type, installed tight, properly fastened, and meets the requirements of ASTM C 1063, ASTM C 847 (expanded metal), ASTM C 933 (Welded Wire), or ASTM C 1032 (Woven Wire), and local building code requirements.

3 All accessories including corner aids, control and expansion joints, casing beads, etc. are properly fastened and positioned according to contract drawings and local building code requirements.

4 Doors, windows, decks, and other openings and penetrations have been properly flashed in accordance with building code and contract documents.

5 Metal roof flashing has been installed in accordance with Asphalt Roofing Manufacturers Association (ARMA) Standards.

6 The substrate is flat within 6.4 mm (1/4 in) in 3.0 m (10 ft).

7 The contractor shall notify the general contractor and/or owner and/or architect of all discrepancies. Do not proceed until unsatisfactory conditions are resolved.

3.02 PREPARATION

A Protection

1 The Commercial Cement Plaster 5 materials shall be protected by permanent or temporary means from weather and other damage prior to, during, and following application, until dry.

2 Protect adjoining work and property.

B Solid surfaces such as precast or cast-in-place concrete or masonry, shall have adequate suction and surface roughness to provide bond. Smooth or non-absorptive surfaces shall be

prepared by the following methods:

1 Sandblasting, wire brushing, acid etching, chipping or any combination thereof. Refer to ASTM D 4258, ASTM D 4259 ASTM D 4260, or ASTM D 4261 as applicable.
2 Application of an approved bonding agent.
3 Where effective bond cannot be achieved, the entire surface shall be covered with furred metal lath in accordance with ASTM C 1063 and building code requirements.

3.03 INSTALLATION

A Mixing and Application Instructions - refer to the product literature for specific mixing and application instructions of each product.
B CCP Base shall be moist cured for a minimum of 48 hours following application.
C CCP Base and reinforced base coat shall be completely dry and cured for a minimum of 7 days prior to application of primer and finish.

3.04 FIELD QUALITY CONTROL

A The lath and water-resistive barrier installation shall be inspected as required by the local building department prior to plaster materials being applied.
B The contractor shall be responsible for the proper application of the Commercial Cement Plaster 5 materials.
C Dryvit assumes no responsibility for on-site inspections or application of its products.

3.05 CLEANING

A All excess Commercial Cement Plaster 5 materials shall be removed from the job site by the contractor in accordance with contract provisions.
B All surrounding areas, where the Dryvit Commercial Cement Plaster 5 has been applied, shall be left free of debris and foreign substances resulting from the contractorÆs work.

3.06 PROTECTION

A The Commercial Cement Plaster 5 materials shall be protected from weather and other damage until permanent protection in the form of flashings, sealants, etc. are installed.

*****END OF SECTION*****

SECTION 09250 - GYPSUM WALLBOARD

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Gypsum Board Walls and Ceilings, complete, in place
B Furring for Suspended Gypsum Board Ceilings.
C Gypsum Board trim and accessories.

1.02. RELATED SECTIONS:

A Section 06100 - Rough Carpentry.
B Section 06200 - Finished Carpentry.
C Section 06400 - Architectural Woodwork.
D Section 09900 - Painting.

1.03. REFERENCES:

A ICBO International Building Code
B ANSI
C USG Drywall Construction Handbook

1.04. SUBMITTALS:

A Samples:
1 Provide one 3' x 3' sample of each finish treatment for approval prior to beginning work. Upon approval, complete the finish treatment to match the sample.

1.05. QUALITY ASSURANCE:

A Install gypsum wallboard to meet requirements of the ICBO International Building Code for Type V-N construction throughout.
B ANSI Specification A97.1 and USG Drywall Construction Handbook (Current Edition) insofar as any portions are applicable, are hereby made a direct part of this specification as though repeated herein.

1.06. DELIVERY, STORAGE AND HANDLING:

A Delivery of Materials:
1 Deliver materials to the project site with manufacturer's labels intact and legible.
2 Handle materials with care to prevent damage.
3 Deliver fire-rated materials bearing testing agency label and required fire

classification numbers.

B Storage of Materials:
1 Store materials inside under cover, stack flat, off floor.
2 Stack wallboard so that long lengths are not over short lengths.

1.07. ENVIRONMENTAL REQUIREMENTS:

A Temperature: During cold weather, in areas receiving wallboard installation, maintain temperature range between 55 degrees F to 70 degrees F for 24 hours before, during and after gypsum wallboard and joint treatment application.

B Ventilation:
1 Provide ventilation during and following adhesives and joint treatment applications.
2 Use temporary air circulators in enclosed areas lacking natural ventilation.
3 Under slow drying conditions, allow additional drying time between coats of joint treatment.

C Protection:
1 Protect installed materials from drafts during hot, dry weather.
2 Protect adjacent surfaces against damage and stains.
3 Protect work installed by other trades previous to work under this section. Any work damaged by workmen of this trade shall be replaced by Contractor without cost to Owner. Provide closures for exterior openings where required. Room temperature during installation of wallboard shall be not less than 50 degree F, with adequate ventilation maintained to eliminate excessive moisture until joint compound is completely dry. Protect wallboard from wetting, and replace any damaged material.

PART TWO - PRODUCTS

2.01. MATERIALS:

A Gypsum Wallboard:
1 ASTM C 36 or FS SS-L-30
2 Thickness: 5/8"
3 Edges: Tapered.
4 Type: "X" at fire rated walls
5 WR at all wet areas, including all walls and ceiling of bathrooms and utility rooms and walls of kitchen behind the sink.

B Joint Treatment Materials:
1 Joint tape: Perforated tape. ASTM C475-64.
2 Joint compound: ASTM C 475-64, Type I. Powered joint compound, or ready-mixed joint compound.
3 Pre-fill joint compound: ASTM C 475-64, Type I. Powdered joint compound.

C Corner bead reinforcement: ANSI CB114 x 114 and shall be installed at all corners.

D Metal edge reinforcement: ANSI LS 58 or LS 12 and shall be installed at all edges of

gypsum board that abut dissimilar materials

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A Check framing for accurate spacing and alignment.
B Verify that spacing of installed framing does not exceed maximum allowable for thickness of wallboard to be used.
C Verify that frames are set for thickness of wallboard to be used.
D Do not proceed with installation of wallboard until deficiencies are corrected and surfaces to receive wallboard are acceptable.
E Protrusions of framing, twisted framing members, or unaligned members must be repaired before installation of wallboard is started.

3.02. PREPERATION:

3.03. INSTALLATION:

A Application of wallboard:
  1 Use wallboard of maximum lengths to minimize end joints.
  2 Stagger end joints when they occur.
  3 Locate end joints as far as possible from center of wall or ceiling.
  4 Abut wallboards without forcing.
  5 Neatly fit ends and edges of wallboard.
  6 Do not place butt ends against tapered edges.
  7 Support ends and edges of wallboard panels on framing or furring members.
B Application to Framing:
  1 Ceilings: Apply wallboard with long dimensions at right angles to framing. Back block ends and edges (and float ends) of wallboard.
  2 Walls:
    a Apply wallboard horizontally.
    b Attach upper wallboard first.
    c Stagger end joints to occur on different framing members on opposite sides of partition.
    d Back block edge joints.
  3 Accessories:
    a Apply corner bead at all corners of walls.

b Apply edge trim at all exposed edges and where gypsum board abut dissimilar material.

C Taping or embedding joints:
1 Apply compound in thin uniform layer to all joints and angles to be reinforced.
2 Apply reinforcing tape immediately.
3 Center tape over joint, and seat tape into compound.
4 Leave approximately 1/64 in. to 1/32 in. compound under tape to provide bond.
5 Apply skim coat immediately following tape embedment but not to function as fill or second coat.
6 Fold tape and embed in angles to provide true angle.
7 Dry embedding coat prior to application of fill coat.

D Filling:
1 Apply joint compound over embedding coat.
2 Fill taper flush with surface.
3 Apply fill coat to cover tape.
4 Feather out fill coat beyond tape and previous joint compound line.
5 Joints with no taper: Feather out at least 4 in. on either side of tape.
6 Do not apply fill coat on interior angles.
7 Allow fill coat to dry prior to application of finish coat.

E Finishing:
1 Spread joint compound evenly over and beyond fill coat on all joints.
2 Feather to smooth uniform finish.
3 Apply finish coat to taped angles to cover tape and taping compound.
4 Sand final application of compound to provide surface ready for decoration.

F Finishing beads and trim.
1 First fill coat: Apply joint compound to bead and trim. Feather out from ground to plane of the surface. Dry compound prior to application of second fill coat.
2 Second fill coat: Apply joint compound in same manner as first fill coat. Extend beyond first coat onto face of wallboard. Dry compound prior to application of finish coat.
3 Finish coat: Apply joint compound to bead and trim. Extend beyond second fill coat. Feather finish coat from ground to plane of surface. Sand finish coat to provide flat surface ready for decoration.

G Corner bead reinforcing: Install at all corners of gypsum board.

H Metal edge reinforcing: Metal edge reinforcing shall be installed on all edges of gypsum board that is exposed or abuts other construction.

3.04. CLEANING - REPAIR:

A Ridging:
1 Do not repair ridging until condition has fully developed. Sand ridges to reinforcing tape without cutting through tape. Fill concave areas on both sides of ridge with topping compound. After fill is dry, blend in topping compound over repaired area.

Fill cracks with compound and finish smooth and flush.

***** END OF SECTION *****

SECTION 09220 - METAL SUPPORT ASSEMBLY

PART ONE - GENERAL

1.01 Section Includes:

A Metal stud interior partition framing.
B Metal interior wall furring.
C Suspended metal channel soffit and ceiling framing.

1.02 Related Sections:

1.03 REFERENCES

In the following paragraphs, retain only those reference standards that are used elsewhere in this section.

A ASTM International (ASTM)
1 A591/A591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Weight (Mass) Applications.
2 A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
3 A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
4 A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
5 C635 - Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
6 C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
7 C645 - Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
8 C754 - Standard Practice for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wall board, Backing Board, or Water-Resistant Backing Board.
9 E90 - Standard Test Method for Airborne Sound Transmission Loss of Building Partitions.
10 E413 - Standard Test Method for Classification for Rating Sound Insulation.

B Gypsum Association (GA) (www.gypsum.org) GA-600 - Fire Resistance Design Manual.

C Steel Stud ManufacturerÆs Association (SSMA) (www.ssma.com) - Member Directory.

D Underwriters Laboratories, Inc. (UL) (www.ul.com) - Fire Resistance Directory.

1.04 SUBMITTALS

A Submittals for Review:
1 Product Data: Illustrate framing types, gages, and locations.

1.05. QUALITY ASSURANCE:

A Manufacturer: Current member of SSMA.
B Installer Qualifications: Minimum years documented experience in work of this Section.
C Fire Resistance Ratings:
1 Construct assemblies to achieve fire resistance ratings indicated on Drawings, in accordance with applicable referenced GA or UL design number.
2 Acoustic Ratings: Construct assemblies to achieve acoustic ratings indicated on Drawings, tested to ASTM E90 and classified in accordance with ASTM E413.

D Deflection Limits:
1 Limit deflection of partitions to following limits, based on 5 PSF uniform design load.
2 Partitions to receive tile: L/360.
3 Other partitions: L/120.
4 Limit deflection of ceilings to L/360.

PART TWO - PRODUCTS

2.01. MATERIALS

A Acceptable Manufacturers:
1.Allsteel and Gypsum Products, Inc.
2.Consolidated Fabricators Corp.
3.Craco Manufacturing., Inc.
4.Custom Stud, Inc.
5.Design Shapes in Steel.
6.Frametek Steel Products.
7.Olmar Supply Inc.
8.Quail Run Building Materials, Inc
9.SCAFCO Corporation.
10.Steel Construction Systems.
11.United Metal Products, Inc.
B Steel: A653/A653M or ASTM A1003/1003M, Class G40 hot dip galvanized.
C COMPONENTS
1 Provide components in accordance with ASTM C645.
2 Studs: Non-load bearing roll-formed steel, SSMA stud profile, C-shaped, punched for

utility access.

3 Top and Bottom Tracks
   a Same material and finish as studs, C-shaped.
   b Standard track: SSMA stud track profile,1-1/2 inch legs.

D Suspended Ceiling Framing:

1.ASTM C635; manufactured specifically for suspended gypsum board ceiling applications.
2.Tees: Double web design; 1-1/2 inches high with 1-3/8 inch wide knurled faces, with interlocking ends and punched holes for cross tees and hanger wires.
3.Material: Galvanized steel.

E Resilient Channels: 1/2 inch deep x 2-1/2 inches wide, 25 gage base steel thickness.

F Wall Furring Channels: Hat shaped, 7/8 inch deep, minimum 25 gage base steel thickness.

2.02. OTHER MATERIALS

A Fasteners: 3/8 inch long pan head screws.
B Wire: ASTM A 641, galvanized steel.
   1 Hanger wire: 8 gage base steel thickness.\
   2 Tie wire: 18 gage base steel thickness, soft annealed.
C Wall Furring Brackets: Galvanized steel, two piece adjustable type.
D Furring Channel Clips: Galvanized steel.

PART THREE - EXECUTION

A INSTALLATION OF PARTITION FRAMING
   1 Install in accordance with ASTM C754 and manufacturer's instructions.
   2 Attach top and bottom tracks at ends and 24 inches on center maximum.
   3 Position studs vertically in tracks, spaced maximum 16 inches on center unless indicated otherwise.
   4 Install deflection track at head of partitions extending to structure. Cut studs 1/2 inch shorter than required length and fit into top track. Fasten studs to top track in manner permitting track movement.
   5 Locate studs maximum 2 inches from door frames and abutting construction.
   6 Use heavier gage studs or double studs on both sides of openings in partitions.
   7 Install horizontal track as header above openings in partitions. Install studs from header to top track.
   8 Brace furred partitions with adjustable bracket located at mid height.
   9 Provide wood or metal bracing in partitions to receive and support fixtures, trim, accessories and other applied items.
   10 Brace ceiling height partitions to structure at 48 inches on center maximum.
B INSTALLATION OF CEILING FRAMING
   1 Install in accordance with ASTM C754 and manufacturer's instructions.

2 Space hanger wires 36 inches on center maximum along runner channels and within 6 inches of ends of channels; secure to structure above.

3 Space runner channels 48 inches on center maximum and within 6 inches of abutting construction.
   a Position channels for ceiling height; level and saddle tie along channels.
   b Provide 1 inch clearance between channels and abutting construction.
   c Overlap channel ends 12 inches at splices; secure each end with double loop tie wire.

4 Space furring channels 16 inches on center maximum, perpendicular to runners and within 6 inches of abutting construction.
   a Provide 1 inch clearance between channels and abutting construction.
   b Secure to runners with clips on alternate sides of runners; saddle tie if clips cannot be alternated.
   c Overlap channel ends 8 inches at splices; secure each end with double loop tie wire.

5 Where openings interrupt furring or runner channels, install reinforcing to restore stability.

6 Provide double runner or furring channels side by side where expansion and control joints occur; do not continue channels over joints.

C INSTALLATION OF CEILING FRAMING

1 Install in accordance with ASTM C636 and manufacture/s instructions.

2 Space hanger wires maximum 48 inches on center. Install additional hangers where required to support light fixtures and ceiling supported equipment.

3 Do not suspend hangers directly from metal deck. Attach steel channel horizontally to adjacent framing members; place hanger at regular spacing.

4 Hang suspension system independent of walls, columns, ducts, pipes, and conduit.

5 Where ducts or other equipment prevent regular spacing of hangers:
   a Reinforce nearest related hangers to span extra distance, or:
   b Suspend steel channel horizontally beneath duct or equipment; place hanger at regular spacing.

6 Install main tees at maximum 48inches on center. Fully engage end locks.

7 Install cross tees perpendicular to main tees to form 24 x 48 inch modules. Lock cross tees to main tees.

D INSTALLATION OF RESILIENT FURRING

1 Install channels perpendicular to framing spaced maximum 16 inches on center. Locate channels within 2 inches of floor and within 6 inches of ceiling.

2 Screw attach channels to each support.

3 Overlap channels minimum 2 inches at splices, centered over framing member. Screw attach to framing member through both flanges.

E INSTALLATION OF WALL FURRING

1 Install in accordance with ASTM C754 and manufacturer's instructions.

2 Space channels 24 inches on center maximum and within 3 inches of corners; secure at maximum 24 inches on center with fasteners staggered on alternating flanges.

3 Nest channels minimum 8 inches at splices; secure with two fasteners in each flange.

F INSTALLATION OF SHAFT WALL SYSTEM

1 Install in accordance with manufacturer's instructions.

2 Position tracks at floor and ceiling with short leg toward finish side of wall; attach at ends and 24 inches on center maximum.

3 If wall height exceeds maximum panel length, position panel end joints within upper or lower third of wall. Stagger joints top and bottom in adjacent panels; reinforce end joints with horizontal stud.

4 Install stud between tracks with liner inserted into stud groove.

5 Progressively install succeeding studs and liner panels.

6 Install full length studs vertically at intersections, door openings, corners, and ends of partitions.

7 Frame openings cut within a liner panel with track around perimeter.

8 Over doors, install horizontal track; attach to studs with clip angles and screws.

*****END OF SECTION*****

SECTION 09300 - CERAMIC TILE

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Ceramic Floor and Wall Tile.
B Mortar setting bed.
C Thin-set to existing construction.

1.02. RELATED SECTIONS: Documents affecting work of this Section include, but are not necessarily limited to;

A General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
B Section 03300 - Concrete.
C Section 06100 - Rough Carpentry.

1.03. SUBMITTALS:

A Submit required information in accordance with Section 01300.
B Samples:
  1 Submit samples of all types of tile specified herein, of the sized specified.
  2 Submit six (6) samples of each tile together with two (2) samples of all trim shapes required.

1.04. QUALITY ASSURANCE:

A Comply with pertinate provisions of Section 01400.
B Grade Certificate:
  1 Furnish Master Grade Certificate for all tile, before installation, bearing the certification mark of the TCA, signed by the manufacturer stating the type and quantity of the material.

1.05. JOB CONDITIONS:

A Comply with pertinate provisions of Section 01500.

1.06. DELIVERY, STORAGE AND HANDLING:

Comply with pertinate provisions of Section 01600.
Deliver tile to the job in unopened cartons, sealed with a grade seal bearing the name of

manufacturer and the words "Standard Grade" printed thereon.

1.06. GUARANTEE:

A Comply with pertinate provisions of Section 01700.

PART TWO - PRODUCTS

2.01 MATERIAL:

A All tile shall be of domestic manufacture, Standard Grade meeting the requirements of SPR R-61 of the U.S. Department of Commerce and shall comply with FS SS-T-308.
B Walls:
  1 Glazed wall tile size 4" x 4".
C Floors:
  1 Unglazed floor tile, 1" x 1" ceramic mosaic.
D Grout:
  1 Grouting material shall be Portland Cement Grout for an approved manufacture as recommended by the manufacturer and acceptable under ANSI Specification referenced. Grout shall be natural gray for ceramic mosaic floors and similar in color to tile elsewhere unless indicated otherwise.
E Colors And Patterns:
  1 Colors will be selected by the Architect from standard color charts.

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. GENERAL:

A References specifications, insofar as any portions are applicable, are hereby made a direct part of this specification as though repeated herein.

3.02. INSTALLATION:

A Install all ceramic tile walls using cement mortar in accordance with ANSI Specification A-108.2.
B Install ceramic tile floors using cement mortar in accordance with ANSI Specification A-108.2.
C Lay out tiles lengthwise on walls so that no tile less than one-half size occurs. Align joints

in wall tile vertically and horizontally. No staggered joints will be permitted. Set all glazed tile units with a spaced joint.

D Grout tile joints flush and face of tiles making a neatly finished smooth surface. Thoroughly wash out tile joints and saturate with clean water before grouting. Grout joints with grouting cement mixed with water to a thick creamy consistency and thoroughly force into all joints to fill entire depth.

3.03. CLEANING:

A Wipe tile clean after grouting and protect against other trades. Do not use acid or acid cleaners for the cleaning of glazed tiles.

***** END OF SECTION *****

SECTION 09500 - ACOUSTICAL TREATMENT

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Lay-in Ceiling Suspension System
B Acoustical Units

1.02. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;

A General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.03. SUBMITTALS:

A If requested, submit information and/or samples as required by the Architect to insure conformity to the specifications.

1.04. DELIVERY, STORAGE AND HANDLING:

A Comply with pertinent provisions of Section 01600.

1.05. ENVIRONMENTAL REQUIREMENTS:

A Comply with pertinent provisions of Section 01700.

PART TWO - PRODUCTS

2.01. MATERIALS:

A Suspension System
  1 Direct suspended exposed fire-rated grid system labeled for 1 hour (24" x 48" and 24" x 24").
  2 Exposed Grid
    a Main beams and main cross beams shall be 25 gauge steel, double web type, 1 1 /2" high with 15/16" bottom flange. Cross beams shall have extended webs for position interlock. Exposed portions shall have factory bake painted finish with colors as selected from manufacturer's custom colors.
    b Splices of all main beams shall be connected to resist 100 lbs. tension parallel to the beam.
    c Interlocking mechanism shall be capable of resisting 100 lbs.tension parallel to the beam.

d All parts shall be of cold-rolled, galvanized bonderized steel.
e Hanger wires shall be 12 gauge annealed galvanized steel hung at 4'0" O.C. each way maximum.
f Provide wall angles at all edges. Attach to wood studs at 16" O.C. with 1 /2" self tapping screws and to concrete walls with 1 /2" lead shields.
g Suspension system shall conform to the requirements of heavy duty structural classification ASTM C-635.
h All hanger wires shall be hung from 1 /2" eye bolts with a minimum thread penetration of 3" in wood joists or bottom of truss cord.

B Acoustical Treatment
1 Acoustical panels shall be 24" x 48" and 24" x 24" , 5/8" thick unless indicated otherwise, square edge lay-in panel. One hour fire rated.
2 Units shall conform the FS SS-S-118, Type III, carrying UL label.
3 Units shall have a factory applied vinyl latex paint finish.

2.02. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

2.03. EXTRA MATERIAL:

A Provide one extra carton of acoustical material of each type to the Owner. Deliver signed receipt for same to the Architect.

PART THREE - EXECUTION

3.01. WORKMANSHIP:

A The suspension system shall support the ceiling assembly indicated with a maximum deflection of 1 /360th of the span.
B There shall be no exposed edges or corners of acoustical tile when installed.
C Intermediate or additional members may be as required, but shall be of same manufacture and material quality and meet the deflection requirement.
D Ceilings shall be level and/or true to plan indicated; grid lines shall be straight. All materials shall fit well together and to other construction.
E Carefully review all architectural, mechanical, plumbing and electrical drawings to be familiar with all elements of work, which occur at areas of acoustical ceilings specified herein. Coordinate work with all trades involved.

3.02. INSTALLATION:

A The AIMA installation requirements and requirements of ASTM C-636 are hereby incorporated into this specification and all work herein shall conform to these requirements as applicable.

B Suspension system shall be installed in accordance with manufacturer's directions and code requirements.

C Suspend main runners of suspension system from structure above at 48" on center by means of wire hangers. Attachment method to structure above must be only to sound, seucre members capable of carrying the new load without deflection. Attachment method and procedure must be approved by the Architect/Engineer. Additional wires shall be provided at all light fixtures and mechanical louver grilles, and devices as required to independently suspend the particular fixture or piece of equipment without imposing additional load on the ceiling system.

D Acoustical materials shall be installed in accordance with manufacturer's directions and code requirements.

E Do not install acoustic units until installation areas meet the following requirements:
1 Exterior openings have been closed and roof is weather-tight.
2 Mechanical, electrical and other work above ceiling has been completed.
3 Wet work has been installed.
4 Temperature and relative humidity have reached levels which comply with acoustic material manufacturer's recommendations for the units to be used in the work.

F Balance border areas to avoid units of less than 1 /2 unit width wherever possible. Wherever ceiling area is a multiple of full size acoustic units used in the work, balance alignment to be square and true and install only full size units for entire ceiling including borders. Check ceiling areas and offsets, furring, etc., to determine most satisfactory installation.

G Run joints between adjacent units parallel to room axis with both directions unless otherwise indicated.

H Fit adjoining tiles to form flush tight joints. Scribe and cut for accurate fit at borders and around work which penetrates ceilings. Plastic edge mold shall be applied on all edges.

I Install units on flange supports of suspended members. Cut as required to fit grid of suspension system. Exercise care in installation so that surfaces are not marred or soiled. Provide hold down clips at all panels.

3.03. CLEANING:

A At completion of job, ceilings shall be checked; broken, damaged or improperly placed panels replaced. Clean soiled or discolored surface of units.

***** END OF SECTION *****

SECTION 09650 - RESILIENT FLOORING

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A Vinyl composition tile
B Vinyl Base
C Rubber Base

1.02. RELATED SECTIONS:

A Section 03300 - Concrete.
B Section 06100 - Rough Carpentry.
C Section 09680 - Carpet.

1.03. SUBMITTALS:

A Product data:
  1 Submit manufacture product description for all items included in this Section.
B Data shall indicate:
  1 Type of product and general information including size, style, etc.
  2 Manufacturers' certificate of conformation to specified standards or products.
  3 Fire rating, flame spreed, fuel contribution, etc.
C Samples. Submitt samples of the full range of colors patterns and texture, for selection. 1. The item selected for use will be removed, and remaining samples returned.

1.04. QUALITY ASSURANCE:

A Installer Qualifications:
  1 Minimum 3 years experience installing resilient floor covering materials.

1.05. DELIVERY, STORAGE AND HANDLING:

A Delivery of Materials:
  1 Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors and patterns, and quality designations legible and intact.
  2 Do not open containers or remove markings until materials are inspected and accepted.
B Storage of Materials:
  1 Store and protect accepted materials in accordance with manufacturer's directions and recommendations.

2 Unless otherwise directed, store materials in original containers at not less than 70 degrees F for not less than 24 hours immediately before installation.

1.06. ENVIRONMENTAL REQUIREMENTS:

A Installation shall not begin until work of other trades is substantially completed.
B Maintain temperature in space to receive resilient floor covering between 70 degrees F and 90 degrees F for not less than 24 hours before and 48 hours after installation.
C Maintain minimum temperature of 55 degrees F after flooring is installed.

1.07. WARRANTY:

A Provide two year warranty against product defects and one year warranty against installation defects.

PART TWO - PRODUCTS

2.01. ACCEPTABLE MANUFACTURERS:

A Vinyl Composition Tile. Armstrong
  1 Kentile
  2 GAF.
B Rubber Base:
  1 Burke Rubber Co.
  2 Textile Rubber Co., Inc. The Johnson Rubber Co. Roppe Rubber Corp.

2.02. MATERIALS:

A FLOOR COVERING MATERIALS
  1 Uniform in thickness and size.
  2 Edges cut accurately and square.\
  3 Uniform color with variations in variegated patterns kept to a minimum.
  4 Size: 12" x 12" x 1/8"
B BASE MATERIALS
  1 Uniform in thickness.
  2 As long lengths as practicable to suit conditions of installation.
  3 Rubber Base: SS-W-40, Type I. 4" high.
  4 Style:
    a Carpet - Flat
    b Elsewhere - coved
  5 Factory Pre-molded internal and external Corners: Match base materials.

2.03. OTHER MATERIALS:

A Provide other materials, not specifically described but required for a complete and proper installation.

B APPLICATION MATERIALS

1 Provide type and brands of adhesive as recommended by manufacturer of covering material for the conditions of the installation.

2.04. EXTRA MATERIAL:

A Furnish materials of each size, color, pattern, and type of material included in the work.

B Furnish materials of the rate of 2% of the amount used on the project.

C Provide the following extra material:

1 Vinyl composition tile: 50 square feet

2 Base: 20 linear feet

PART THREE - EXECUTION

3.01. EXAMINATION:

A Inspect the sub-floor to receive flooring. Do not lay any flooring until sub-floors are in proper condition to receive same. Sub-floor shall be industrial vacuum clean, free of all foreign matter and thoroughly dry before flooring installation.

B Concrete sub-floors shall have a smooth, even surface, free of score marks, grooves or depressions, scraped free of all foreign matter and brushed clean.

C Examine substrate for excessive moisture content and unevenness which would prevent execution and quality of resilient flooring as specified.

D Do not proceed with installation of resilient flooring until defects have been corrected except where correction is indicated under PREPARATION in this Section.

3.02. PREPARATION:

A Remove dirt, oil, grease or other foreign matter from surfaces to receive floor covering materials.

3.03. INSTALLATION:

A APPLICATION OF ADHESIVES

1 Mix and apply adhesives in accordance with manufacturer's instructions.

2 Provide safety precautions during mixing and applications as recommended by adhesive manufacturer.

3 Apply uniformly over surfaces.

4 Cover only that amount of area which can be covered by flooring material within the recommended working time of the adhesive.

5 Remove any adhesive which dries or films over.

6 Do not soil walls, bases, or adjacent areas with adhesive.
7 Promptly remove any spillage.
8 Apply adhesives with notched trowel or other suitable tool.
9 Clean trowel and re-work notches as necessary to insure proper application of adhesive.

B INSTALLATION OF RESILIENT FLOORING

1 Follow adhesive manufacturer's directions for mixing and applying adhesive. Cover surface evenly with adhesive. The area covered by one application of adhesive shall not exceed the maximum working area recommended by the manufacturer. If adhesive films over or dries before flooring installation, remove all adhesive and recoat with new adhesive. Install flooring within time limit recommended by the manufacturer.
2 Install in strict accordance with the instructions and specifications of the flooring manufacturer. Install in a manner to produce smooth and even-finished surfaces with a minimum of seams. Install beveled, rounded or tapered edge strips wherever edges are exposed.
3 Lay grain in one direction.
4 Fit flooring material neatly and tightly into breaks and recesses, against bases, around pipes and penetrations, under saddles or thresholds, and around permanent cabinets and equipment.

C INSTALLATION OF BASE

1 Install base using adhesive and method recommended by the manufacturer. Install tightly, neatly and form as long lengths as practical. Scribe base accurately to trim at doors.
2 Install base around perimeter of room or space and at toe spaces of cabinets.
3 Unroll base material and cut into accurate lengths as desired, or as required for minimum number of joints.
4 Match edges at all seams or double cut adjoining lengths.
5 Install with tight butt joints with no joint widths greater than 1 /64 in.
6 No base piece shall be less than 24" long except where wall length is less than 614".
7 Where wall is less than 24", one piece shall be used.
8 Install pre-molded corners at all corners.

3.04. PROTECTION

A Keep traffic to an absolute minimum until flooring has become well seated, at least 48 hours, at a maintained temperature of not less than 70 degrees F. and under no conditions shall fixtures, equipment, trucks, etc., be allowed.

3.05. CLEANING:

A Upon completion of the installation of floor covering, adjacent work, and after materials have set, clean surfaces with a neutral cleaner as recommended by the manufacturer for the type of floor covering material installed. Protect completed work from traffic and damage until acceptance by the Owner.

*** END OF SECTION ***

SECTION 09680 - CARPET

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A. Carpeting - Direct glue-down.
B. Carpet accessories.

1.02. SUBMITTALS:

A. Samples:
   1. Samples of the full range of colors and patterns of carpet and of exposed accessories available from the proposed manufacturers in the specified qualities.
B. Shop Drawings:
   1. Shop Drawings showing location of seams and locations and types of carpet metal and accessories.
C. Manufactures Literature:
   1. Materials list of items proposed to be provided under this Section;
   2. Manufacturers specifications and other data needed to prove compliance with the specified requirements;
   3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
   4. After the Architect has selected the color and pattern, submit three Samples of each specified color and pattern from the stock proposed to be installed. Secure the Architect's approval of these Samples prior to installation.

PART TWO - PRODUCTS

2.01. ACCEPTABLE MANUFACTURERS:

A. Provide "Design VI, Pattern L5099" manufactured by Lees Carpet Division of Burlington Industries, Inc., or provide equal products of other manufacturers when approved in advance by the Architect.

2.02. MATERIALS:

A. CARPET
   1. Provide carpeting with at least the following minimum attributes:
   2. Weave: Velvet Woven through the back. Surface: Alternating cut and loop. Gage: 108-108.

3. Stitches: Eight per inch.
4. Pile height: 0.255".
5. Face yarn: Four-ply Antron III continuous filament nylon.
6. Face yarn wight: 34.7 ox. per sq yd. Total weight: 65.3 Oz. per sq yd. Backing material: Polypropylene. Dye method: Yam dyed knit-de-knit.
7. Static parameter: 300 V at 20% relative humidity at 70 degrees F.
8. Flame spread: 64 maximum.
9. Smoke developed: 121 maximum.
10. Installation method: glue-down.

2.03. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.
B. Adhesives:
   1. Provide white latex carpet adhesive such as W.W. Henry Company No. 356, Roberts Company No. 41-0504, or an equal approved by the Architect and recommended for the purpose by the manufacturer of the proposed carpet.
   2. Provide seam adhesive such as W.W. Henry Company No. 246, Roberts Company No. 41-0502, or an equal approved by the Architect and recommended for the purpose by the manufacturer of the proposed carpet.
   3. At intersection of carpet and floor tile, provide Mercer Plastics Company, Inc., "Custom Edge Carpet Bar No. 90," vinyl, or equal, in color selected by the Architect.

2.04. EXTRA MATERIAL:

A. Allow the Owner to inspect and select from scrap carpet remaining after the installation. Bungle, wrap in burlap, and deliver to the Owner the carpet scraps selected by him.

PART THREE - EXECUTION

3.01. EXAMINATION:

A. Examine the areas and conditions under which work of this SEction will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02. PREPERATION:

A. Immediately prior to installation of the work of this Section, thoroughly clean substrata and remove oil, grease, paint, varnish, hardeners, and other items which would adversely affect the bond of adhesive.

B. Make substrata level and free from irregularities. Assure one constant floor height after carpet is in-stalled, filling low spots and grinding high spots as required.

3.03. INSTALLATION:

A. General:\
   1. Glue directly to the floor, using no pads and no foam.
   2. Scribe the carpet accurately to vertical surfaces.
   3. Align the lines of carpet, as woven, using no fill strips less than 6" wide, laying all carpet in the same direction unless specifically directed otherwise by the Architect.
   4. Where carpeting is used on the walls, install as directed by the manufacturer, and trim the top edge and exposed vertical edges with a brass cap approved by the Architect.

B. Seams:
   1. Locate seams only where shown on the approved Shop Drawings, or where specifically otherwise approved by the Architect.
   2. Locate seams to the maximum extent practicable out of the way of traffic.
   3. Fabricate seams by the compression method, using a butt joint, and properly bead and seal.
   4. Do not stretch seams.

C. In addition to the cleaning requirements stated elsewhere, thoroughly clean carpet and adjacent surfaces prior to final acceptance of the carpeted areas by the Owner.

3.04. PROTECTION

A. Provide a heavy non-staining paper or plastic walkway as required over carpeting in direction of traffic, maintaining intact until carpeted space is accepted by the Owner.

***** END OF SECTION *****

SECTION 09900 - PAINTING

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A. Painting and finishing of all exterior and interior surfaces listed on the Painting Schedule in Part 3 of this Section, in accordance with the types of finish shown on the Room Finish Schedule on the Drawings, and as specified herein.

1.02. RELATED SECTIONS:

A. Shop Painting: Pertinent Sections for fabricated materials.
B. Section 07900 - Caulking and Sealants.
C. Division 15 - Piping Identification.
D. Factory Prefinished Items as specified.

1.03. SUBMITTALS:

A. Submit Product Data for all items included in this Section with sufficient information to assure conformance to the Specifications.

1.04. QUALITY ASSURANCE:

A. All the painting and decorating shall be in accordance with the Manual of the Painting and Decorating Contractors of America, Type I, "Recommended Job".
B. Include on label of containers:
   1. Manufacturer's name
   2. Type of paint.
   3. Manufacturer's Stock number
   4. Color
   5. Instructions for reducing, where applicable.
   6. Label analysis
C. Field Quality Control
   1. Request review of first finished room, space, or item of each color scheme required by Architect for color, texture, and workmanship.
   2. Use first acceptable room, space or item as project standard for each color scheme.
   3. For spray application, paint surface not smaller than 100 sq. ft. as project standard.

1.05. DELIVERY, STORAGE AND HANDLING:

A. Delivery of Materials:
   1. Deliver all paint to the site in manufacturer's labeled and sealed containers. Label

shall give manufacturer's name, brand, type, batch number, color of paint and instructions for thinning.

B. Storage of Materials:
   1. Store all materials used on the job in a single space designated by the Architect. Such storage place shall be kept clean. Make good any damage to it or its surroundings. Remove any oily rags, waste, etc., from the building every night and take every precaution to avoid any danger of fire.
   2. Store only acceptable project materials on project site.
   3. Restrict storage to paint materials and related equipment.
   4. Comply with health and fire regulations.

1.06. ENVIRONMENTAL REQUIREMENTS:

A. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied.
B. Do not apply finish in areas where dust is being generated.

PART TWO - PRODUCTS

2.01. ACCEPTABLE MANUFACTURERS:

A. Paint, Varnish and Fillers:
   1. Pratt & Lambert
   2. Deer-O
   3. Pittsburgh Paint
   4. Fuller-O-Brien
   5. Dutch Boy
   6. Glidden
B. Stain:
   1. Olympic
   2. Cabot's
   3. Pittsburgh Paints
C. Materials selected for coating systems for each type surface shall be the product of a single manufacturer.
D. Unless otherwise indicated, similar products of acceptable manufacturers listed may be furnished in lieu of those specified.

2.02. MATERIALS:

A. General:
   1. Brands of paint, varnish and stains and basic painting materials such as linseed oil, shellac, turpentine thinners, driers, etc., shall be of highest quality, made by reputable, recognized manufacturers and have identifying labels on containers, and shall be

approved by the Architect. All paint materials shall be factory fresh.

2. All materials shall be "first line" products; however, such products bearing "Professional Label" will be acceptable.
3. Products specified are as manufactured by the following:
   a. Paint, Varnish and Fillers: Pratt and Lamber
   b. Stain: Olympic

B. Material List:
1. Enamel Undercoater: "61 Enamel Undercoating"
2. Interior Enamel: "Cellu-Tone Stain Luster Enamel"
3. Clear Wood Sealer: "Filler/Sealer"
4. Wood Stain(s): "Olympic Semi-Transparent"
5. Varnish: "38 Clear Finish"
6. Interior Wall and Ceiling Primer: "Vapex Wall Primer".
7. Interior Semi-gloss Wall Paint: "Cellutone Satin Luster Enamel"
8. Metal Primers
   a. Ferrous: "Red latex Primer"
   b. Galvanized: "Galvanized Metal Latex Primer"
9. Oils: Manufacturer's standard
10. Thinners: Manufacturer's standard.

C. COLORS: As selected.

2.3. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

2.04. EXTRA MATERIAL:

A. Upon completion of the work, furnish Owner with one new quart each of each type and color of paint used on the project. Label all containers accordingly.

PART THREE - EXECUTION

3.01. EXAMINATION:

A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into an acceptable condition through preparatory work.

3.02. PREPERATION:

A. General: Do not begin painting on any surface until it has been inspected and is in proper condition to receive the paint as specified. Should any surface be found unsuitable to

produce a proper paint finish, notify the Architect in writing. Apply no material until the unsuitable surfaces have been made satisfactory. After acceptance of surface, by application of first coat of paint, assume responsibility for and rectify any unsatisfactory finish resulting. Prepare all surfaces in accordance with paint manufacturer's recommendation.

B. Wood: Sandpaper to smooth and even surface and then dust off. After priming or stain coat has been applied, thoroughly fill all nail holes and other surface imperfections with putty, tinted with primer or stain to match wood color. Sand all woodwork between coats to a smooth surface. Cover knots and sap streaks with a thin coat of shellac.

C. Ferrous Metal: Remove grease, rust and rust scale and touch up any chipped or abased places on items that have been shop coated. Where ferrous metal has a heavy coating of scale, remove by descaling or wire brushing as necessary to produce a satisfactory surface for painting.

D. Galvanized Metal: Thoroughly clean by wiping surfaces with surface conditioner and prime with galvanized iron primer.

3.03. INSTALLATION:

A. General Requirements:
   1. All surfaces exposed in the finish work except glass, finish hardware or surfaces having a factory applied finish shall be painted with an appropriate finish even though not specifically mentioned here.
   2. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items or provide ample protection of such items. On completion of each space, replace above items. Use only skilled mechanics for removing and connecting above items. Protect adjacent surfaces as required or directed.
   3. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.
   4. Test with moisture meter.
   5. Apply paint, enamel, and varnish with suitable brushes, rollers, or spraying equipment.\
   6. Rate of application shall not exceed that as recommended by material manufacturer for the surface involved (less 10% allowance for loss if manufacturer's printed recommended specifications do not state the recommended rate includes normal expected losses).
   7. Keep brushes, rollers, and spraying equipment clean, dry, free from contaminants and suitable for the finish required.
   8. Apply stain by brush.
   9. Comply with recommendation of product manufacturer for drying time between succeeding coats.
   10. Vary slightly the color of successive coats.
   11. Sand and dust between each coat to remove defects visible from a distance of 5 feet.
   12. Finish coats shall be smooth, free of brush marks, streaks, laps or pile up of paints, and skipped or missed areas.

13. Finished metal surfaces shall be free of skips, voids or pinholes.
14. Stain or paint only when surfaces are clean, dry, smooth and adequately protected from dampness. Each coat of paint shall be well-brushed on, worked out evenly and allowed to dry at least 24 hours before the subsequent coat is applied.
15. Finished work shall be uniform, of approved color, smooth and free from runs, sags, clogging or excessive flooding. Make edges of paint adjoining other materials or colors sharp and clean, without overlapping. Where high gloss enamel is used, lightly sand undercoats to obtain a smooth finish coat.
16. At completion, touch up and restore finish where damaged and leave finish surfaces in good condition.
17. Apply all paints at the recommended spreading rates of the manufacturer. Coating may be checked for mil-thickness.

B. Inspection:

1. Do not apply additional coats until completed coat has been inspected by the Architect.
2. Only inspected coats of paint will be considered in determining number of coats applied.
3. Leave all parts of moldings and ornaments clean and true to details with no undue amount of paint in corners and depressions.
4. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
5. Apply primer on all work before glazing.
6. Change colors at door where colors differ between adjoining spaces or rooms and where door frames match wall colors.
7. Refinish whole wall where portion of finish has been damaged or is not acceptable.
8. Perform all work using only experienced, competent painters in accordance with the best standards of practice in the trade. Hand brush or roll work except where otherwise permitted or directed. When completed, the painting shall represent a first class workmanlike appearance. Apply all paint materials under adequate illumination, and in accordance with paint manufacturer's recommendations.
9. Thin paint materials only in accordance with the printed directions of the manufacturer.
10. Job mixing or job tinting may be done when approved by the Architect and for sample colors.
11. Tint all primers and undercoats to approximately the color of the finish coat.
12. Finish edges, tops and bottoms of all doors same as door faces. Both sides and all edges of doors to be finished simultaneously.
13. Prime coats specified will not be required on items delivered with prime or shop coats already applied, unless otherwise specified.
14. Field painting will not be required on items specified to be completely finished at the factory.

3.04. CLEANING:

A. Touch up and restore finish where damaged.
B. Remove spilled, splashed or splattered paint from all surfaces.
C. Do not mar surface finish of item being cleaned.
D. Leave storage space clean and in condition required for equivalent spaces in project.

3.5. PAINTING SCHEDULE

A. Exterior Coating System
   1. Exterior Wood (facias, beams, etc.) New Construction.\
      a. 1st Coat - Exterior Wood Primer.
      b. 2nd Coat - Semi-gloss Acrylic Latex.
      c. 3rd Coat - Semi-gloss Acrylic Latex.
   2. Galvanized Metal.
      a. 1st Coat - Zinc Dust - Zinc Oxide Metal Primer.
      b. 2nd Coat - Semi-gloss Acrylic Latex.
      c. 3rd Coat - Semi-gloss Acrylic Latex.
   3. Ferrous Metals.
      a. 1st Coat - Factory primer or Alkyd Metal Primer.
      b. 2nd Coat - Latex Semi-Gloss Enamel.
      c. 3rd Coat - Latex Semi-Gloss Enamel

B. Interior Coating System
   1. Gypsum Wall Board Walls and Ceilings.
      a. 1st Coat - Latex Wall Primer.
      b. 2nd Coat - Semi-gloss Latex.
      c. 3rd Coat - Semi-gloss Latex.
   2. Interior Cabinets.
      a. 1st Coat - Interior Wood Stain.
      b. 2nd Coat - Fast-Dri Sealer.
      c. 3rd Coat - Mavethane Stain Varnish. 4th Coat - Mavethane stain Varnish
   3. Primed Metal (Metal doors and frames).
      a. 1st Coat - Factory Primed.
      b. 2nd Coat - Latex Semi-Gloss Enamel.
      c. 3rd Coat - Latex Semi-Gloss Enamel
   4. Ferrous Metals (Semi-Gloss) - Doors and frames, railings, miscellaneous metals.
      a. 1st Coat - Factory Primer or Approved Metal Primer (Field touch-up required on factory primed metals when necessary)
      b. 2nd Coat - Semi-Gloss Enamel.
      c. 3rd Coat - Semi-Gloss Enamel
   5. Louvers, Grilles, Registers (Semi-Gloss). (Spray paint before installing).
      a. 1st Coat - Semi-Gloss Enamel.
      b. 2nd Coat - Semi-Gloss Enamel
   6. Surfaces visible through registers, grilles, vents and covered windows;

7. 1st Coat - Flat black paint (over prepared surfaces)
8. Plumbing, Mechanical and Electrical (Semi-Gloss)
   a. All exposed piping and conduit, except conduit in mechanical rooms, unfinished fixtures, metal ducts, switch boxes, control panels, devices, starters and junction boxes. Color to match adjacent surfaces.
9. Galvanized metal shall be pretreated as specified hereiN
   a. 1st Coat - Approved Metal Primer.
   b. 2nd Coat - Semi-Gloss Enamel.
   c. 3rd Coat - Semi-Gloss Enamel.

***** END OF SECTION *****

DIVISION 10 - SPECIALTIES

SECTION 10150 - COMPARTMENTS - TOILET

PART ONE - GENERAL

1.01. SECTION INCLUDES:

A. Laminated Plastic Toilet Partitions.
B. Floor Mounted Plastic Toilet Partitions System.
C. Ceiling Hung Metal Toilet Partitions System.
D. Floor Mounted Metal Toilet Partitions System.

1.02. RELATED SECTIONS:

A. Section 10800: Toilet room accessories.

1.03. SUBMITTALS:

A. Product Data:
   1. Materials List of items proposed to be provided under this Section.
   2. Manufacturers Specifications and other data needed to prove compliance with the specified requirements.
B. Shop Drawings:
   1. In sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
   2. Color and pattern charts showing colors and patterns available in the specified products from the proposed manufacturer.
   3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.4. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.5. ENVIRONMENTAL REQUIREMENTS:

A. Comply with pertinent provisions of Section 01700.

PART TWO - - PRODUCTS

2.1. MATERIALS:

A. FLOOR MOUNTED PLASTIC TOILET PARTITIONS SYSTEM.

1. Toilet partitions shall be floor mounted, overhead braced with non-corrosive panels, doors and pilasters similar and equal to "Poly-Mar HD".
2. Panels, Doors and Pilasters shall be fabricated from Polymer resins under high pressure forming a single component section which is waterproof, non-absorbant and has a self-lubricating surface. All panels, doors and pilasters shall be protected with plastic covering as required.
3. Construction:
   a. Doors Panels, and Pilasters shall be 1" thick and all edges machined to a radius of .250" and all exposed edges to be free of saw marks.
   b. The Color shall extend from the surface thru the entire thickness of the panels, doors and pilasters.
   c. Dividing panels and doors shall be 55" high and mounted 14" above the floor.
   d. Aluminum edging strips shall be fastened to the bottom edge of all panels and doors full length.
   e. Pilasters shall be 82" high and fastened to 3" high 20 gauge stainless steel shoes with theft proof sex bolts.
4. Door hardware shall be as follows:
   a. Hinges heavy aluminum extrusion, clear anodized finish, wrap around flanges, surface mounted and thru-bolted to doors and pilasters with one-way sex bolts. Hinges to be set at 15 deg. open when not in locked position.
   b. Each door shall be furnished with coat hook and rubber bumper.
   c. Door strike and keeper heavy aluminum extrusion, clear anodized finish, wrap around flanges, surface mounted and thru-bolted to pilasters with one-way sex bolts.
   d. Door latch housing heavy aluminum extrusion, clear anodized finish, wrap around flanges, surface mounted and thru-bolted to door with one-way sex bolts.
5. Pilaster shoes shall be anchored to floor with plastic anchors and stainless steel screws.
6. Wall brackets shall be full length aand continuous and achored as per manufacturers written instructions.
7. Headrail shall be aluminum extrusion, mill finish with anti-grip configuration. thru-bolted to pilaster and bracket with one-way sex bolts.
8. Headrail brackets shall be 16 gauge stainless steel.

2.02. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. EXAMINATION:

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02. PREPERATION:

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.03. INSTALLATION:

A. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use.
B. Adjust doors, except doors to handicapped compartments, to remain at a uniformly open position when unlooked.

3.04. CLEANING:

A. Touch-up scratches and abrasions to be completely invisible to the unaided eye from a distance of five feet.

***** END OF SECTION *****

SECTION 10400 - IDENTIFYING DEVICES

PART ONE - - GENERAL

1.01. DESCRIPTION

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:

1. Project Signage.
2. Room Numbers.
3. Street Address Numbers.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;

1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 08700 - Door Hardware.

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.
B. Product Data:

1. Materials list of items proposed to be provided under this section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Details of installation and anchorage sufficient to enable proper interface of the work of this Section with the work of other trades.
4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.03. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.04. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.05. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. EXTERIOR LETTERING SCHEDULE:

A. Exterior lettering for individual unit doors shall be furnished with threaded studs for flush mounting on Finish shall be Alcoa Super Alumalure baked enamel. These shall be as

2.02. ACCEPTABLE MANUFACTURERS

A. Design in based on use of standard products manufactured by Architectural Signing, Inc.herein.
B. Provide the products upon which design is based, or provide equal products of another manufacturer approved in advance by the Architect.
C. Except as otherwise approved by the Architect, provide all products of this Section from a single manufacturer.stucco over wood frame. directed by the Architect. Exterior letters shall be:
   1. Metal Arts Division L and H Manufacturing Co. OR equal

2.03. ADDRESS INDENTIFICATION

A. Consult the Architect in advance and secure the official street address number.
B. Provide the manufacturer's standard mounting system as appropriate for the surfaces shown on the Drawings.

PART THREE - EXECUTION

3.01. SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02. INSTALLATION

A. Install the work of this Section in strict accordance with the manufacturers' recommendations as approved by the Architect, using only the approved mounting materials, and locating all components firmly into position, level and plumb.

***** END OF SECTION *****

NOT USED

DIVISION 12 - FURNISHINGS

NOT USED

NOT USED

DIVISION 14 - CONVEYING EQUIPMENT

SECTION 14240 - HYDRAULIC ELEVATORS

PART ONE - GENERAL

1.01 SUMMARY

A. Section includes: Hydraulic passenger elevators as shown and specified. Elevator work includes:
   1. Standard pre-engineered hydraulic passenger elevators.
   2. Elevator car enclosures, hoistway entrances and signal equipment.
   3. Jack(s).
   4. Operation and control systems.
   5. Accessibility provisions for physically disabled persons.
   6. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
   7. Materials and accessories as required to complete the elevator installation.

B. Related Sections:
   1. Division 3 Concrete: Installing inserts, sleeves and anchors in concrete.
   2. Division 4 Masonry: Installing inserts, sleeves and anchors in masonry.
   3. Division 5 Metals:
      a. Providing hoist beams, pit ladders, steel framing, auxiliary support steel and divider beams for supporting guide-rail brackets.
      b. Providing steel angle sill supports and grouting hoistway entrance sills and frames.
   4. Division 9 Finishes: Providing elevator car finish flooring and field painting unfinished and shop primed ferrous materials.
   5. Division 22 Plumbing:
      a. Sump pit and oil interceptor.
   6. Division 23: Heating, Ventilation and Air Conditioning
      a. Heating and ventilating hoistways and machine rooms.
   7. Division 16 Sections:
      a. Providing electrical service to elevators, including fused disconnect switches.
      b. Emergency power supply, transfer switch and auxiliary contacts.
      c. Heat and smoke sensing devices.
      d. Convenience outlets and illumination in machine room, hoistway and pit.

C. Work Not Included: General contractor shall provide the following in accordance with the requirements of the Model Building Code and ANSI A17.1 Code. For specific rules, refer to ANSI A17.1, Section 300 for hydraulic elevators. State or local requirements must be used if more stringent.
   1. Elevator hoist beam to be provided at top of elevator shaft. Beam must be able to

accommodate proper loads and clearances for elevator installation and operation.

2. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports and bracing including all setting templates and diagrams for placement.
3. Hatch walls require a minimum two hours of fire rating. Hoistway should be clear and plumb with variations not to exceed 1/2" at any point.
4. Elevator hoistways shall have barricades, as required.
5. Install bevel guards at 75 on all recesses, projections or setbacks over 2" (4" for A17.1 2000 areas) except for loading or unloading.
6. Provide rail bracket supports at pit, each floor and roof. For guide rail bracket supports, provide divider beams between hoistway at each floor and roof. \
7. Pit floor shall be level and free of debris. Reinforce dry pit to sustain normal vertical forces from rails and buffers.
8. Where pit access is by means of the lowest hoistway entrance, a vertical ladder of non-combustible material extending 42" minimum, (48" minimum for A17.1-2000 areas) shall be provided at the same height, above sill of access door or handgrips.
9. Machine room to be enclosed and protected.
10. Machine Room temperature must be maintained between 55 and 90 F.
11. If machine room is remote from the elevator hoistway, clear access must be available above the ceiling or metal/concrete raceways in floor for oil line and wiring duct from machine room.
12. Access to the machinery space and machine room must be in accordance with the governing authority or code.
13. Provide an 8ö x 16ö cutout through machine room wall, for oil line and wiring duct, coordinated with elevator contractor at the building site. \
14. All wire and conduit should run remote from either the hoistways or the machine room.
15. When heat, smoke or combustion sensing devices are required, connect to elevator machine room terminals. Contacts on the sensors should be sided for 120 volt D.C.
16. Install and furnish finished flooring in elevator cab.
17. Finished floors and entrance walls are not to be constructed until after sills and door frames are in place. Consult elevator contractor for rough opening size. The general contractor shall supply the drywall framing so that the wall fire resistance rating is maintained, when drywall construction is used.
18. Where sheet rock or drywall construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with elevator contractor.
19. Before erection of rough walls and doors; erect hoistway sills, headers, and frames. After rough walls are finished; erect fascias and toe guards. Set sill level and slightly above finished floor at landings.
20. To maintain legal fire rating (masonry construction), door frames are to be anchored to walls and properly grouted in place.
21. The elevator wall shall interface with the hoistway entrance assembly and be in strict

compliance with the elevator contractor's requirements.

22. General Contractor shall fill and grout around entrances, as required.
23. Elevator sill supports shall be provided at each opening.
24. All walls and sill supports must be plumb where openings occur.
25. For applications with jack hole, free and clear access to the elevator pit area for the jack hole-drilling rig is required.
26. Where jack hole is required, remove all spoils from jack hole drilling.
27. When not provided by Elevator Contractor, jack hole shall accommodate the jack unit. If required the jack hole is to be provided in strict accordance with the elevator contractor's shop drawings.
28. Locate a light fixture and convenience outlet in pit with switch located adjacent to the access door.
29. A light switch and fused disconnect switch for each elevator should be located inside the machine room adjacent to the door, where practical, per the National Electrical Code (NFPA No. 70).
30. As indicated by elevator contractor, provide a light outlet for each elevator, in center of hoistway (or in the machine room).
31. For signal systems and power operated door: provide ground and branch wiring circuits, including main line switch. For car light and fan: provide a feeder and branch wiring circuits, including main line switch.
32. Wall thickness may increase when fixtures are mounted in drywall. These requirements must be coordinated between the general contractor and the elevator contractor.
33. Provide supports, patching and recesses to accommodate hall button boxes, signal fixtures, etc..
34. Locate telephone and convenience outlet on control panel.

1.02 SUBMITTALS

A. Product data: When requested, the elevator contractor will provide standard cab, entrance and signal fixture data to describe product for approval.

B. Shop drawings:

1. Show equipment arrangement in the machine room/control space, pit and hoistway. Provide plans, elevations, sections and details of assembly, erection, anchorage, and equipment location.
2. Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
3. Show floors served, travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
4. Indicate electrical power requirements and branch circuit protection device recommendations.

C. Powder Coat Paint selection: Submit manufacturerÆs standard selection charts for exposed finishes and materials.

D. Plastic laminate selection: Submit manufacturerÆs standard selection charts for exposed finishes and materials.

E. Metal Finishes: Upon request, standard metal samples provided.

F. Operation and maintenance data. Include the following:
   1. Owners Manual and Wiring Diagrams.
   2. Parts list, with recommended parts inventory.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: An approved manufacturer with minimum fifteen years experience in manufacturing, installing, and servicing elevators of the type required for the project.
   1. Must be the manufacturer of the power unit, controller, signal fixtures, door operators cab, entrances, and all other major parts of the elevator operating equipment.
      a. The major parts of the elevator equipment shall be manufactured in the United States, and not be an assembled system.
   2. The manufacturer shall have a documented, on-going quality assurance program.
   3. ISO-9001:2000 Manufacturer Certified
   4. ISO-14001:2004 Environmental Management System Certified

B. Installer Qualifications: The manufacturer or an authorized agent of the manufacturer with not less than fifteen years of satisfactory experience installing elevators equal in character and performance to the project elevators.

C. Regulatory Requirements:
   1. ASME/ANSI A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
   2. Building Code: National.
   3. NFPA 70 National Electrical Code.
   4. NFPA 80 Fire Doors and Windows.
   5. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
   6. CAN/CSA C22.1 Canadian Electrical Code.
   7. CAN/CSA B44 Safety Code for Elevators and Escalators.

D. Fire-rated Entrance Assemblies: Opening protective assemblies including frames, hardware, and operation shall comply with ASTM E2074, CAN4-S104 (ULC-S104), UL10(B), and NFPA 80. Provide entrance assembly units bearing Class B or 1 1/2 hour

label by a Nationally Recognized Testing Laboratory (2 hour label in Canada).

E. Inspection and testing: Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation.

1. Arrange for inspections and make required tests.
2. Deliver to the Owner upon completion and acceptance of elevator work.

1.04 DELIVERY, STORAGE AND HANDLING

A. Manufacturing will deliver elevator materials, components and equipment and the contractor is responsible to provide secure and safe storage on job site.

1.05 PROJECT CONDITIONS

A. Prohibited Use: Elevators shall not be used for temporary service or for any other purpose during the construction period before Substantial Completion and acceptance by the purchaser unless agreed upon by Elevator Contractor and General Contractor with signed temporary agreement.

B. Provide the hole for the jack unit (if required by the type of jack provided), based on excavation through normal soil or clay which can be removed by manual digging or by standard truck-mounted regular drilling unit. Provide a casing if required to retain the walls of the hole. General contractor shall remove excavation spoils deposited in the elevator pit.

1. If a physical obstruction or hindrance is encountered below the ground surface, including boulders, rock, gravel, wood, metal, pilings, sand, water, quick sand, caves, public utilities or any other foreign material, obtain written authorization to proceed with excavating using special excavation equipment.
2. Maintain a daily log of time and material costs involved.
3. Elevator contractor will be compensated on a time and material basis for additional costs incurred after encountering the physical obstruction or hindrance, including the cost of the special excavation equipment.

1.06 WARRANTY

A. Warranty: Submit elevator manufacturer's standard written warranty agreeing to repair, restore or replace defects in elevator work materials and workmanship not due to ordinary wear and tear or improper use or care for 12 months after completion of installation or acceptance thereof by beneficial use, whichever is earlier.

1.07 MAINTENANCE

A. Furnish maintenance and call back service for a period of 3 months for each elevator after

completion of installation or acceptance thereof by beneficial use, whichever is earlier, during normal working hours, excluding callbacks. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.

1. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: ThyssenKrupp Elevator

2.02 MATERIALS, GENERAL

B. Colors, patterns, and finishes: As selected by the Architect from manufacturer's standard colors, patterns, and finish charts.

C. Steel:
   1. Shapes and bars: Carbon.
   2. Sheet: Cold-rolled steel sheet, commercial quality, Class 1, matte finish.
   3. Finish: Factory-applied baked enamel.

D. Plastic laminate: Decorative high-pressure type, complying with NEMA LD3, Type GP-50 General Purpose Grade, nominal 0.050" thickness.

E. Carpet: By others.

2.03 HOISTWAY EQUIPMENT

A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood subfloor. Underside of the platform shall be fireproofed. The car platform shall be designed and fabricated to support one-piece loads weighing up to 25% of the rated capacity.

B. Sling: Steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure.

C. Guide Rails: Steel, omega shaped, fastened to the building structure with steel brackets.

D. Guide Shoes: Slide guides shall be mounted on top and bottom of the car.

E. Buffers: Provide substantial buffers in the elevator pit. Mount buffers on a steel template that is fastened to the pit floor or continuous channels fastened to the elevator guide rail or securely anchored to the pit floor. Provide extensions if required by project conditions.

F. Jack: Jack unit shall be of sufficient size to lift the gross load the height specified. Factory test jack to insure adequate strength and freedom from leakage. Brittle material, such as gray cast iron, is prohibited in the jack construction. Provide the following jack type: Single post conventional (in ground). Single polished steel hydraulic plunger housed in a steel sealed casing with sufficient clearance space to allow for alignment during installation. The casing shall have a dished endcap and safety bulkhead as required by A17.1 code. The plunger shall have a high-pressure sealing system which will not allow for seal movement or displacement during the course of operation. The jack system will be supplied with schedule 40 pvc or an HDPE protection system complying with A17.1 code requirements to prevent in ground corrosion of the casing. The jack casing shall have a bleeder valve to discharge any air trapped in the jack.

G. Automatic Self-Leveling: Provide each elevator car with a self-leveling feature to automatically bring the car to the landings and correct for overtravel or undertravel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained approximately level with the landing irrespective of its load.

H. Wiring, Piping, and Oil: Provide all necessary hoistway wiring in accordance with the National Electrical Code. All necessary code compliant pipe and fittings shall be provided to connect the power unit to the jack unit. Provide proper grade readily biodegradable oil as specified by the manufacturer of the power unit (see Power Unit section 2.04.G for further details)

2.04 POWER UNIT

A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit consisting of the following items:

1. Oil reservoir with tank cover.
2. An oil hydraulic pump.
3. An electric motor.
4. Oil control valve with the following components built into single housing; high pressure relief valve, check valve, automatic unloading up start valve, lowering and leveling valve, and electro-magnetic controlling solenoids.

B. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service. Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation. Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.

C. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating shall be selected for specified speed and load.

D. Control System: Shall be microprocessor based and protected from environmental extremes and excessive vibrations in a NEMA 1 enclosure.

E. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.

1. Relief valve shall be externally adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.

2. Up start and stop valve shall be adjustable and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.

3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.

4. Lowering valve and leveling valve shall be adjustable for down start speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling after slowdown is initiated.

F. Solid State Starting: Provide an electronic starter featuring adjustable starting currents.

G. Oil Type: USDA certified biobased product, ultra low toxicity, readily biodegradable, energy efficient, high performing fluid made from canola oil with antioxidant, anticorrosive, antifoaming, and metal-passivating additives. Especially formulated for operating in environmentally sensitive areas

2.05 HOISTWAY ENTRANCES

A. Doors and Frames: Provide complete hollow metal type hoistway entrances at each hoistway opening bolted\knock down construction.

1. Manufacturer's standard entrance design consisting of hangers, doors, hanger supports, hanger covers, fascia plates, sight guards, and necessary hardware.

2. Main landing door & frame finish: ASTM A1008 steel panels, factory applied powder coat finish.

3. Typical door & frame finish: ASTM A 366 steel panels,factory applied powder coat enamel finish.

B. Interlocks: Equip each hoistway entrance with an approved type interlock tested as required by code. Provide door restriction devices as required by code.

C. Door Hanger and Tracks: Provide sheave type two point suspension hangers and tracks for each hoistway horizontal sliding door.

1. Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.

2. Hangers: Provide an adjustable device beneath the track to limit the up-thrust of the doors during operation.

3. Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

D. Hoistway Sills: Extruded metal, with groove(s) in top surface. Provide mill finish on aluminum.

2.06 CAR ENCLOSURE

A. Car Enclosure:

1. Walls: Cab type TKAP, reinforced cold-rolled steel with two coats factory applied baked enamel finish, with applied vertical wood core panels covered on both sides with high pressure plastic laminate.

a. Reveals and frieze: Powder Coated

2. Canopy: Cold-rolled steel with hinged exit.

3. Ceiling: Downlight type, metal pans with suspended LED downlights.

4. Cab Fronts, Return,Transom, Soffit and Strike: Provide panels faced with brushed stainless steel.

5. Doors: Horizontal sliding car doors reinforced with steel for panel rigidity. Hang doors on sheave type hangers with polyurethane tires that roll on a polished steel track and are guided at the bottom by non-metallic sliding guides.

a. Door Finish: ASTM A1008 steel panels, factory applied powder coat enamel finish.

b. Cab Sills: Extruded aluminum, mill finish.

6. Handrail: Provide 1.5" diameter cylindrical metal on side and rear walls on front opening cars and side walls only on front and rear opening cars. Handrails shall have a stainless steel, no. 4 brushed finish.

7. Ventilation: ManufacturerÆs standard exhaust fan, mounted on the car top.

B. Car Top Inspection: Provide a car top inspection station with an Auto-Inspectionö switch, an "emergency stop" switch, and constant pressure "up and down" direction and safety buttons to make the normal operating devices inoperative. The station will give the inspector complete control of the elevator. The car top inspection station shall be mounted in the door operator assembly.

2.07 DOOR OPERATION

A. Door Operation: Provide a direct current motor driven heavy duty operator designed to

operate the car and hoistway doors simultaneously. Door movements shall be electrically cushioned at both limits of travel and the door operating mechanism shall be arranged for manual operation in event of power failure. Doors shall automatically open when the car arrives at the landing and automatically close after an adjustable time interval or when the car is dispatched to another landing. Closed-loop, microprocessor controlled motor-driven linear door operator, with adjustable torque limits, also acceptable. AC controlled units with oil checks or other deviations are not acceptable.

1. No Un-Necessary Door Operation: The car door shall open only if the car is stopping for a car or hall call, answering a car or hall call at the present position or selected as a dispatch car.
2. Door Open Time Saver: If a car is stopping in response to a car call assignment only (no coincident hall call), the current door hold open time is changed to a shorter field programmable time when the electronic door protection device is activated.
3. Double Door Operation: When a car stops at a landing with concurrent up and down hall calls, no car calls, and no other hall call assignments, the car door opens to answer the hall call in the direction of the car's current travel. If an onward car call is not registered before the door closes to within 6 inches of fully closed, the travel will reverse and the door will reopen to answer the other call.
4. Nudging Operation: The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door closing is prevented for a field programmable time, a buzzer will sound. When the obstruction is removed, the door will begin to close at reduced speed. If the infra-red door protection system detects a person or object while closing on nudging, the doors will stop and resume closing only after the obstruction has been removed.
5. Limited Door Reversal: If the doors are closing and the infra-red beam(s) is interrupted, the doors will reverse and reopen partially. After the obstruction is cleared, the doors will begin to close.
6. Door Open Watchdog: If the doors are opening, but do not fully open after a field adjustable time, the doors will recycle closed then attempt to open six times to try and correct the fault.
7. Door Close Watchdog: If the doors are closing, but do not fully close after a field adjustable time, the doors will recycle open then attempt to close six times to try and correct the fault.
8. Door Close Assist: When the doors have failed to fully close and are in the recycle mode, the door drive motor shall have increased torque applied to possibly overcome mechanical resistance or differential air pressure and allow the door to close.

B. Door Protection Devices: Provide a door protection system using 150 or more microprocessor controlled infra-red light beams. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed, the doors shall immediately reopen.

2.08 CAR OPERATING STATION

A. Car Operating Station, General: The main car control in each car shall contain the devices required for specific operation mounted in an integral swing return panel requiring no applied faceplate. Swing return shall have a brushed stainless steel finish. The main car operating panel shall be mounted in the return and comply with handicap requirements. Pushbuttons that illuminate using long lasting LEDÆs shall be included for each floor served, and emergency buttons and switches shall be provided per code. Switches for car light and accessories shall be provided.

B. Emergency Communications System: Integral phone system provided.

C. Auxiliary Operating Panel: Not Required

D. Column Mounted Car Riding Lantern: A car riding lantern shall be installed in the elevator cab and located in the entrance. The lantern, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.

E. Special Equipment: Not Applicable

2.09 CONTROL SYSTEMS

A. Controller: The elevator control system shall be microprocessor based and software oriented. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops, and by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings.
B. Automatic Light and Fan shut down: The control system shall evaluate the system activity and automatically turn off the cab lighting and ventilation fan during periods of inactivity. The settings shall be field programmable.
C. Emergency Power Operation: (10-DOA) Upon loss of the normal power supply, building-supplied standby power is available on the same wires as the normal power supply. Once the loss of normal power is detected and standby power is available, the elevator is lowered to a pre-designated landing and the doors are opened. After passengers have exited the elevator, the doors are closed and the car is shut down. When normal power is restored, the elevator automatically resumes operation.
D. The control system shall have ked switches for owner access to basement and 1st floor loading area.

2.10 HALL STATIONS

A. Hall Stations, General: Provide buttons with red-illuminating LED halos to indicate that a call has been registered at that floor for the indicated direction. Provide 1 set of pushbutton risers.

Provide one pushbutton riser with faceplates having a brushed stainless steel finish.

1. Phase 1 firefighterÆs service key switch, with instructions, shall be incorporated into the hall station at the designated level.

B. Floor Identification Pads: Provide door jamb pads at each floor. Jamb pads shall comply with Americans with Disabilities Act (ADA) requirements.

C. Hall Position Indicator: An electronic dot matrix position indicator shall be provided and mounted for optimum viewing. As the car travels, its position in the hoistway shall be indicated by the illumination of the alphanumeric character corresponding to the landing which the elevator is stopped or passing. When hall lanterns are provided, the position indicator shall be combined with the hall lanterns in the same faceplate. Faceplates shall match hall stations. Provide at all typical landings.

D. Hall lanterns: Not Applicable

2.11 MISCELLANEOUS ELEVATOR COMPONENTS

A. Oil Hydraulic Silencer: Install an oil hydraulic silencer (muffler device) at the power unit location. The silencer shall contain pulsation absorbing material inserted in a blowout proof housing arranged for inspecting interior parts without removing unit from oil line.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Before starting elevator installation, inspect hoistway, hoistway openings, pits and machine rooms/control space, as constructed and verify all critical dimensions, and examine supporting structures and all other conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

A. Install elevator systems components and coordinate installation of hoistway wall construction.

1. Work shall be performed by competent elevator installation personnel in accordance with ASME A17.1, manufacturer's installation instructions and approved shop drawings.

2. Comply with the National Electrical Code for electrical work required during installation.

B. Jack unit excavation (if required by the type of jack provided): Drill or otherwise excavate below elevator pit construction as required to install the jack unit.

1. Install casing for jack unit.
2. Provide HDPE jack protection system for all in ground jacks.
3. Set casing for jack unit assembly plumb, and partially fill with water-settled sand, eliminating voids. Back fill depth shall be sufficient to hold the bottom of the jack in place over time.

C. Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.

D. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum safe, workable dimensions at each landing.

E. Lubricate operating parts of system where recommended by manufacturer.

3.03 FIELD QUALITY CONTROL

A. Acceptance testing: Upon completion of the elevator installation and before permitting use of elevator, perform acceptance tests as required by A17.1 Code and local authorities having jurisdiction. Perform other tests, if any, as required by governing regulations or agencies.

B. Advise Owner, Contractor, Architect, and governing authorities in advance of dates and times tests are to be performed on the elevator.

3.04 ADJUSTING

A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.

3.05 CLEANING

A. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless stall shall be cleaned with soap and water and dried with a non-abrasive surface; shall not be cleaned with bleached-based cleansers.

B. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoistway. Remove trash and debris.

3.06 PROTECTION

A. At time of Substantial Completion of elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

3.07 DEMONSTRATION

A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions.

B. Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion. Determine that control systems and operating devices are functioning properly.

3.08 ELEVATOR SCHEDULE

A. Elevator Qty. 1
   1. Elevator Model: endura Below-Ground Conventional
   2. Rated Capacity: 3500 lbs.
   3. Rated Speed: 125 ft./min.
   4. Operation System: TAC32
   5. Travel: 37'-9"
   6. Landings: 5 total
   7. Openings:
      a. Front: 4
      b. Rear: 1
   8. Clear Car Inside: 7'-0"' wide x 5' - 5 1/2" deep
   9. Cab Height: 8'-0" nominal
   10. Hoistway Entrance Size: 3' - 6" wide x 7'-0" high
   11. Door Type: Center Opening

12. Power Characteristics: 230 volts, 3 Phase, 60 Hz.
13. Seismic Requirements: Zone 3+
14. Fixture & Button Style: Signa4 Signal Fixtures
15. Special Operations:

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15010 - GENERAL PROVISIONS - MECHANICAL

PART ONE - GENERAL

1.01 DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
   1. General requirements of the plumbing and mechanical systems.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. All Sections of Division 15.
   3. Appropriate Sections of other Divisions.

C. INTENT
   1. It is the intention of the Specifications and drawings to call for finished work, tested and ready for operation. Any apparatus, appliance, material, or work not shown on drawings, but mentioned in the Specifications or vice versa, or any incidental accessories necessary to make the work complete and ready for operation, even if not particularly specified, shall be provided without additional expense to the Owner;. Should there appear to be discrepancies or questions of intent in the Contract Documents, refer the matter to the Architect for his decision before ordering any materials or equipment or before the start of any related work. The decision of the Architect shall be final, conclusive, and binding.

D. DRAWINGS AND DATA
   1. Drawings are generally diagrammatic and are intended to convey scope of work and to indicate general arrangement of equipment, ducts, conduits, piping, and fixtures. They are not intended to show every offset or fittings or every structural difficulty that may be encountered during installation of the work. Location of all items not definitely fixed by dimensions are approximate only. Exact locations necessary to secure best conditions and results must be determined at Project and shall have approval of Architect before being installed. Do not scale drawings.
   2. If so directed by Architect, without extra charge, make reasonable modifications in layout as needed to prevent conflict with work of other trades or for proper execution work.
   3. Include minor details not usually shown or specified, but necessary for proper installation and operation of a system or piece of equipment in work and in bid price, the same as if specified or shown.

1.02 SUBMITTALS:

A. Submit required information in accordance with Section 01300.
B. Provide shop drawings consisting of manufacturer's certified scale drawings, cuts, catalogs, or descriptive literature and complete certified characteristics of equipment, dimensions,capacity, code requirements, motor drive, testing, and certified performance curves for all fans and pumps.
C. INSTRUCTION MANUALS
   1. Each manual shall contain the following items.
      a. List of all equipment with manufacturer's name, model number and local representative, service facilities and normal channel of supply for each item.
      b. Manufacturer's literature describing each item of equipment with detailed parts list.
      c. Detailed step-by-step instruction for starting, summer operation, winter operation, and shutdown of each system.
      d. Detailed maintenance instructions for each system and piece of equipment.
      e. Copy of each automatic control diagram with respective sequence of operation.
      f. Individual equipment guarantees.
      g. Certificates of Inspection.
      h. Record blueprints and related shop drawings.
      i. Typewrite or print all written material contained in manual.

1.03 QUALITY ASSURANCE:

A. CODES
   1. Include in work, without extra cost to Owner, labor, materials, services, apparatus, drawings (in addition to Contract Drawings and Documents) required to comply with applicable laws, ordinances, rules, and regulations.
   2. Drawings and Specifications take precedence when they are more stringent than codes, ordinances, standards, and statutes. Codes, ordinances, standards, and statutes take precedence when they are more stringent or conflict with drawings or Specifications. Following industry standard, specifications and codes are minimum requirements:
      a. Applicable city, county, and state mechanical, electrical, gas, plumbing, health and sanitary codes, laws and ordinances.
      b. City or other applicable building codes.
      c. National Electrical Manufacturers' Association Standards.
      d. National Electric Safety Code.
      e. Underwriters' Laboratories, Inc. Standards.
      f. American National Standards Institute.
      g. American Society for Testing Materials Standards.
      h. Uniform Mechanical Code with local amendments.

i. Uniform Plumbing Code with local amendments
j. Standards and requirements of local utility companies.
k. National Fire Protection Association Standards.
l. American Society of Mechanical Engineers Boiler and Pressure Vessel Codes.

1.04 GUARANTEE:

A. Each complete system guaranteed by Contractor for a period of one year from date of acceptance of work by Owner in writing, to be free of defects of materials and workmanship, and to perform satisfactorily under all conditions of load or service. The guarantees provide that any additional controls, protective devices, or equipment be provided as necessary to make the system of equipment operate satisfactorily, and that any faulty materials or workmanship be replaced or repaired. On failure of guarantor to do the above after written notice from Owner, the Owner may have the work done at the cost of the guarantor. Loss of refrigerant is considered a defect in workmanship and/or equipment, to be corrected as required at no extra cost to the Owner.

PART 2 - PRODUCTS

2.01 GENERAL:

A. APPROVED MANUFACTURERS:
1. Materials and equipment standard products of a reputable manufacturer regularly engaged in manufacture of the specified items. Where more than one unit is required of any item, furnish by the same manufacturer, except where specified otherwise. Install material and equipment in accordance with manufacturer's recommendations. Should variance between plans and specifications occur with these, contact Architect immediately so that variations in installation can be known by all parties concerned.
2. Manufacturer's nameplate, name or trademark permanently affixed to all equipment and material furnished under this Specification.
a. Nameplate of subcontractor or distributor not acceptable.
b. Provide equipment form manufacturer whose products have local representation.

2.02 MATERIAL:

A. MOTORS AND STARTERS
1. All electrical motors induction type conforming the requirements of NEMA, NL, and NEC, suitable for required load, voltage, duty, phase, frequency, service and location. Motors are furnished and installed under the Mechanical Section specifying the driven equipment.
a. Limit maximum motor speeds to 1750 rpm, unless otherwise specified.
b. Provide totally enclosed, fan cooled (TEFC) motors outside the building or

otherwise exposed to the weather, or suitable protect per NEMA standards. Provide open drip-proof motors generally inside the building, except where splash-proof or explosion-proof construction is required.

c. Provide motors with double shielded, grease lubricate, ball bearings with grease pockets on each side for re-greasing in service. Provide inlet and outlet grease connections in motor housings for each bearing. Proved factory sealed permanently lubricated ball bearings on roof mounted motors. Provide sleeve bearings where so specified.

d. Provide single phase motors of permanent split capacitor type unless otherwise specified. Provide with integral thermal overload protection.

e. Provide multi-speed motors of separate winding, variable torque type, unless otherwise specified or indicated.

2. All motor starters provided under Electrical Division, unless furnished as an integral part of manufacturer's packaged equipment, or specified to be furnished with equipment. Responsibility for providing starter compatible with motor furnished rests with starter supplier.

2.03 OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. EXISTING INSTALLATION AND CONFLICTS

1. Protect existing active services (water, gas, sewer, electric), when encountered, against damage from construction work. Do not prevent or disturb operation of active services which are to remain.
2. Contractor responsible for all costs incurred by above shutdowns, including bypass or jumper installations, for work performed under this Section.
3. If existing active utility services are encountered which require relocation, make request to proper authorities for determination of procedures. Properly terminate existing services to be abandoned in conformance with requirements of authorities.

B. TEMPORARY OPENINGS

C. Ascertain temporary openings required for admission of apparatus. Notify General Contractor accordingly. Provide such openings at no additional cost to Owner.

D. SLEEVES

1. Furnish and set sleeves in locations where pipes pass through floors, walls, partitions, and roofs.

E. EXCAVATION AND BACKFILL

1. Perform necessary excavation, shoring and backfilling required for the proper laying of pipes and conduits inside the building and premises, and outside as may be

necessary. Remove excavated materials as directed.

2. Excavation and backfill as described for similar work under Sitework Division.
3. Perform work under appropriate Mechanical Section.

F. PIPE EXPANSION AND CONTRACTION; VIBRATIONS

1. Install pipe connections to allow for freedom of movement of piping during expansion, contraction or vibration. Provide swing joints with proper anchors and guides as required or where shown on drawings. Anchors and guides subject to review.
2. Provide power driven equipment of quiet operation and free of vibration. Construct and brace metal partitions, ducts, sheet metal housings, etc., so that there will be no vibration or raffling when the system is in operation.
3. Design and construct connections to the equipment so that noise and vibration will not reach the conditioned areas through ducts, conduits, piping, and sheet metal to the building construction.

G. SCAFFOLDING, RIGGING AND HOISTING

1. Provide scaffolding, rigging, hoisting, and services necessary for erection and delivery of equipment and materials provided under this Division. Remove same from premises when no longer required.

H. HANGERS, INSERTS, SUPPORTS AND BASES

1. Provide required structural members, hangers, supports and inserts to keep piping and equipment in proper alignment and prevent transmission of injurious thrusts and vibration. Do not weaken concrete or penetrate waterproofing.
2. Support equipment on curbs, legs, or steel framework. Provide all bases and supports, not part of building structure, unless specifically indicated to be under another division. Materials and equipment furnished or provided under this Division as described for similar work under other divisions. Furnish required foundation sizes, bolts, washers, sleeves, plates, templates, etc., for equipment provided. Review concrete, masonry, metal, or wood bases for adequacy and suitability and provide costs for necessary modifications such review may establish.

I. NAMEPLATES AND CODING

1. Identify all items of mechanical and electrical equipment by approved nameplates. Secure nameplates to each individual piece of equipment and to each starter, switch, relay, transformer, etc. that controls equipment. Nameplates to bear notations corresponding to notations on operating instructions. Nameplates 1/16 inch black laminated plastic with engraved white core letters and four-edge bevel, 2-1/2 inches by 3/4 inch;or aluminum with black enameled background and etched or engraved natural aluminum lettering 2 inches by 3/4 inch. Confirm nameplate nomenclature with Owner.
2. Tag all valves except fixtures stops, with brass tags minimum 1-1/2 inches in diameter with depressed black-filled letters and numbers. Numbers minimum 1 /2 inch high, letters minimum 1/4inch.
3. Secure tags to valves with approved brass "S" hooks or nickel- plated chain.
4. Stencil identification labels on pipe and ducts after finishing painting is completed.

Place labels at sufficient intervals throughout the system, preferably adjacent to valves and fittings, to ensure ready recognition

5. Maximum spacing 40 feet o.c. In concealed areas provide identification at access panels. In finished areas, label exposed pipe or ducts only as directed by Architect. Size of stencil letters per ANSI A13.1, except that identification tags may be used when outside diameter of pipe or coverings is less than 1 inch. Place stencils to be legible from floor level. Provide stenciled flows arrows in addition to labels.

J. ESCUTCHEON

1. Provide escutcheons at all exposed areas.

K. PAINTING

1. All unpainted, non-insulated, non-galvanized, ferrous metal surfaces of pipes, equipment, fixtures, hangers, supports, and accessories painted under Painting Section of Finishes Division.
2. Repair and refinish finished surfaces scuffed or damaged by installation of work under this Division.
3. Nameplates on equipment cleaned and left free of paint.

L. TEST AND ADJUSTMENTS

1. Labor, materials, instruments and power required for testing provided under respective Sections hereafter for work under that Section.
2. Tests shall be performed to satisfaction of Architect and regulating authority having jurisdiction. Submit to Architect written certificate that tests have been performed in accordance with Specification requirements.
3. Pressure test piping before connection to equipment. No piping equipment, or accessories subjected to pressures exceeding their rating.
4. Repair or replace defective work and repeat test until particular system and component parts thereof receive approval of Architect and regulation authority. Any damages resulting from tests repaired, and damaged materials replaced, all to satisfaction of Architect and at no cost to Owner.
5. No piping in any location closed up, furred in, or covered before testing.
6. Test all systems as specified under various applicable Sections. Duration tests determined by authority having jurisdiction and in no case less than time specified.
7. Drain water used for testing from the system after tests are complete. Repair or replace any damages caused water left in system at Contractor's expense.

M. CLEANING

1. During course of construction, cap all ducts, pipe, equipment and electrical conduit in approved manner to insure adequate protection against entrance of foreign substances. Protect all fans, impellers, coils, filters and contactors.

N. LUBRICATION

1. Extend grease fittings on all bearings to points of ready and easy accessibility.
2. Lubricate, as required, all motor and fan bearings, etc., before operation of any equipment.

3. Provide a final lubrication to all equipment requiring same immediately before turning over to Owner.

"" END OF SECTION ""

SECTION 15050 - BASIC MATERIALS AND METHODS

PART ONE - GENERAL

1.01 DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
   1. PIPE AND PIPE FITTINGS
      a. Pipe, fittings and connectors.
      b. Sanitary drainage and vent system piping.
      c. Domestic water system piping.
   2. VALVES, COCKS, AND FAUCETS.
      a. Hose bibbs.
      b. Combination balance and shut-off valves.
   3. All pumps except where integral part of a manufactured piece of equipment. Pump controls where self-contained.
   4. SUPPORTS, ANCHORS AND SEALS:
      a. Pipe hangers and supports
      b. Duct hangers and supports
      c. flashing for mechanical equipment.
      d. Sleeving for mechanical equipment.
      e. Equipment supports.
   5. EXPANSION COMPENSATION:
      a. Pipe loops and swing joints.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Appropriate Sections of Division 15.

1.02 QUALITY ASSURANCE:

A. Welding materials to conform to ASME Code and applicable state labor regulations.
B. Employ certified welders in accordance with ASME Section 9 ANSI/AWS D1.1.
C. Domestic Water, Drainage and Vent Piping; Fuel Gas Piping: Applicable building codes and UPC 1982.
D. Pipe Supports: ANSI 831.1, Power Piping.

PART TWO - PRODUCTS

2.01 GENERAL:

A. APPROVED MANUFACTURERS:

1. Valves, cocks, and Faucets;
a. Crane, DeZurik, Fairbanks, Jenkins Grinnell, Nibco-Scoff, Lunkenheimer, Powell.
b. Provide valves of same manufacturer throughout where possible.
c. Provide valves with manufacturer's name and pressure rating clearly marked on outside of body.

2.02 MATERIAL:

A. PIPE AND PIPE FITTINGS

1. PIPE AND TUBE
a. Steel Pipe: ANSI/ASTM Al20, black, Schedule 40 weight.
b. Hubless Cast Iron Soil Pipe: CISPI 301.
c. Cast Iron Water Pipe Flanged: ANSI/AWWA C151.
d. Copper Water Tube: ASTM B88, Type (K) (L) (M), hard and seamless.
e. Brass Pipe: ANSI/ASTM B43, IPS 85 red brass.
f. PVC Plastic Pipe: ANSI/ASTM D1784, Schedule 80.
g. Glazed Vitreous Clay Pipe: ASTM C700 (extra) strength.

2. PIPE AND TUBE JOINTS AND FITTINGS
a. Steel Pipe Fittings: (ANSI/ASME B16.3) (ANSI/ASTM Al26) FS WW-P-521, CLASS 150).
b. Cast Iron Pipe Fittings: (ANSI/ASTM A74) (ASTM C564, rubber gasket joints) (ANSI/AWWA C606, grooved and shouldered joints) (ANSI/AWWA C 111,rubber gasket joints), CISP 1-301 Hubless, drainage pattern.
c. Copper (and Brass) Pipe Fittings: (ANSI/ASME B16.22. pressure fittings).
d. PVC Pipe Fittings: ANSI/ASTM D2729.
1) Solvent for PVC Jointing: ANSI/ASTM D2564.

3. UNIONS AND COUPLINGS
a. Pipe Size 2 Inches and Under: 150 psi malleable iron for threaded ferrous piping; bronze for copper or brass pipe soldered joints.
b. Pipe Size Over 2 Inches: 150 psi forged steel slip-on flanges for ferrous piping; bronze flanges for copper or brass piping; synthetic rubber gaskets for gas service; 1/16 inch thick preformed synthetic rubber bonded to asbestos elsewhere.
c. Grooved and Shouldered Pipe Ends: Malleable iron housing clamps to engage and lock, designed to permit some angular deflection, contraction and expansion; C-shape composition sealing gasket, steel bolts, nuts and washers; galvanized couplings for galvanized pipe.

4. STRAINERS
a. Full line size, Y-type.
b. Provide cast iron body and stainless steel element in iron and steel piping systems.
c. Provide cast bronze body and brass element in copper piping systems.
d. Pipe sizes 2 inches and smaller shall have threaded connections. Pipe sizes 2-1/2 inches and larger shall have flanged connections.

e. Perforations shall be suitable for intended service. Screen free area minimum three times area of inlet pipe. Provide valved drain and hose connection off stainer bottom.
f. Strainer shall be designed for not less than 125 psi working pressure or 150% of system operating pressure, whichever is greater.

5. DIELECTRIC INSULATION FITTINGS

a. Dielectric fittings, unions, bushings or couplings, for water connections to domestic hot water heaters and connections between ferrous and copper pipe.

6. VALVES, COCKS, AND FAUCETS;

1. VALVE CONNECTIONS

2. a. Provide valves suitable to connect to adjoining piping as specified for pipe joints.

b. Use pipe size valves.

c. Thread pipe sizes 2 inches and smaller.

d. Flange pipe sizes 2-1/2 inches and larger.

e. Solder or screw to solder adaptors for copper tubing.

f. Use grooved body valves with mechanical grooved jointed piping.
Provide butterfly valve with tapped lug body when used for isolating service.

7. GATE VALVES

3. a. Bronze, rising stem, solid wedge or disc, solder or screwed ends.

b. Iron body, bronze trim, rising stem, OS&Y, solid wedge, flanged ends.

8. GLOBE OR ANGLE VALVES

4. a. Bronze, rising stem, inside screw, renewable composition disc, solder or screwed

b. ends.
Iron body, bronze trim, rising stem, OS&Y, renewable composition disc, flanged ends.

9. CHECK VALVES

5. a. Bronze, swing disc, solder or screwed ends.

b. Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends.

c. Iron body, bronze trim, spring loaded, renewable composition disc, flanged ends.

d. Check valves in pump discharge lines, metraflex or equivalent spring type silent check.

10. PLUG COCKS

6. a. Iron body, brass pugs and washers, air tested, solder or screwed ends.

b. Iron body and plug, pressure lubricated type, flanged ends.

11. BALL VALVES

7. a. Bronze, full port, 3 piece construction, blowoutproof stem.

12. BUTTERFLY VALVES

8. a. Iron body, bronze disc, resilient replaceable liner seat, plain, flanged or grooved ends.

13. DRAIN VALVES: Bronze compression stop with nipple and cap or hose thread.

14. HOSE BIBBS: Bronze or red brass, replaceable hexagonal disc, hose thread spout, chrome plated where exposed.

15. COMBINATION BALANCE AND SHUTOFF VALVES
    a. Bronze body, resilient seat, adjustable memory stop with indicator, nonremovable lever, screwed ends.
    b. Iron body, resilient seat, adjustable memory stop with indicator, nonremovable lever, flanged ends
    c. DeZurik Series 100 eccentric value or approved equal.

B. VALVE OPERATORS
1. Provide suitable handwheels for gate, globe or angle, radiation and drain valves, and inside hose bibbs.
2. Provide one plug cock wrench for every ten plug cocks sized 2 inches and smaller, minimum of one. Provide each plug cock sized 2-1/2 inches and larger with a wrench, with set screw
3. For butterfly valves provide gear operators for sizes 8 inches and larger. For smaller sizes provide lever lock handle with toothed plated for shut-off service and infinitely adjustable handle with lock nut and memory stop for throttling service.
4. Provide valves located more than 7 feet from floor in equipment room areas with chain operated sheaves. Extend chains to about 5 feet above floor and hook to clips arranged to clear walking aisles.

C. PRESSURE RATINGS
1. Unless otherwise indicated, use valves suitable for 125 minimum psig WSP and 450 degrees and 200 psig and 250 degrees
2. Use valves for fire protection suitable for 175 psig WOG. C. SUPPORTS, ANCHORS AND SEALS:

D. INSERTS
1. Malleable iron case of (galvanized) steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching forms.
2. Size inserts to suit threaded hanger rods.
3. When hanging from steel, use concentrically loading beam clamps. Eccentric attachments are prohibited.

E. PIPE HANGERS AND SUPPORTS
1. Acceptable Manufacturers: Fee and Mason, Grinell, Michigan, Elcen, Superior, F&S Central
2. Hangers: Pipe sizes 1 /2 inch to 1-1 /2 inches: Adjustable wrought steel ring.
3. Hangers: Pipe sizes 2 inches to 4 inches and cold pipe sizes 6 inches and over, adjustable wrought steel clevis.
4. Hangers: Hot Pipe sizes 6 inches and over, adjustable steel yoke and cast iron roll.
5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll stand for hot pipe sizes 6 inches and over.
6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches and over.
7. Vertical Support: Steel riser clamp.

h. Floor Support for Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange and concrete pier to steel support.
I. Floor Support for Hot Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws and concrete pier or steel support.
j. Design hangers to impede disengagement by movement of supported pipe.
k. Provide copper plated hangers and supports for copper piping or provide sheet lead packing between hanger or support and piping.
I. Provide Stoneman "Trisolators" or Potter-Roemer PR-Isolators at pipe hanger, support, bracket or strap on all uninsulated copper pipe 1 /2 inch and larger.

F. HANGER RODS

a. Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.

G. DUCT HANGERS AND SUPPORTS

a. Hangers: Galvanized steel band, iron or rolled angle and 3/8 inch rods.
b. Wall Supports: Galvanized steel band, iron or fabricated angle bracket.
c. Vertical Support at Floor: Rolled angle.

H. FLASHING

a. Roof Flashing Assemblies Stoneman Stormtite lead roof flashing assemblies with steel reinforced vari-pitch boot, caulk-type open top model, Type 1100-4 4 lb. lead, 8 inch skirt, for pipes other than plumbing vents passing through roof. Flash plumbing vents with 4 lb. sheet lead extending at least 12 inches from vents at roof, with upper end turned down into vent pipe.
b. Steel Flashing: 26 gauge galvanized steel.
c. Lead Flashing: 4 lb/sq. ft. sheet lead for waterproofing, 1 lb/sq. ft. sheet lead to soundproofing.
d. Safes: 5Ib/sq. ft. sheet lead or 8 mil thick neoprene.
e. Caps: Steel, 22 gauge minimum, 16 gauge at fire resistant structures.

I. SLEEVES

a. Furnish and set sleeves in locations where pipe or conduit pass through floors, walls, partitions, and roof. Assume cost for cuffing, patching, finishing, etc. resulting from failure to accomplish this requirement. Openings no to impair strength, function, or esthetics of work cut.
b. Provide pipes passing through floors, walls, partition, or roofs with sleeves having internal diameter 1 inch larger than outside diameter of pipe, or of insulation on covered lines.
c. In sleeves passing through fire walls or floors, floors and partitions, pack space between sleeve and pipe or insulation with nonshrink grout, or other approved sealant materials. Install rigid calcium silicate insert on insulated pipe. Approved prefabricated assembles, Pipe Shields or equal, are acceptable.
d. Sleeves through outside walls or through slab-on-grade (except soil pipe through slab): Schedule 40 black steel pipe with 150 lb. black steel slip on welding flange welded at center of sleeve and painted with one coat of bitumastic paint inside and outside. Space between sleeve and pipe packed with lead wool or oakum to within 2 inches of each face of wall. Remaining space packed and sealed watertight with waterproof compound. Fabricated seals, Thunderline Link-Seal or equal, are acceptable.
e. Sleeves passing through roof construction: Extend minimum 8 inches above rook flash, and sealed watertight, with safe support of conduit and equipment furnished under each Division.
f. Sleeves through interior walls: 18 gauge galvanized sheet steel, set flush with finished surfaces

of partitions.
g. Sleeves passing through membrane waterproofing: Provide 16 gauge soft sheet copper or 4 lb. lead flashing extending 12 inches beyond sleeves in all directions; secure to waterproofing or lead safe, turn down flashing into space between pipe and sleeve;insert oakum gasket, pour lead, caulk watertight.
h. Rectangular Ducts: Form with galvanized steel.
I. Round Ducts: Form with galvanized steel or wood.
j. Size large enough to allow for movement due to expansion and to provide for continuous insulation.

J. ESCUTCHEONS
1. Fit exposed pipes or conduit passing through floors, walls or ceilings with one-piece chrome brass plates with round head set screws.
2. Escutcheons of sufficient outside diameter to cover sleeve opening and fit snugly around pipe. Provide special deep escutcheons where necessary to cover fittings or sleeves extending through floors.
3.

2.03 OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01 GENERAL:

A. PIPE AND PIPE FITTINGS
1. Ream pipe and tube ends. Remove burrs, (Bevel plain and ferrous pipe).
2. Remove scale and dirt, inside and outside, before assembly.
3. Remove welding slag or foreign material from pipe and fitting materials. Unless specifically detailed otherwise, run piping concealed throughout finished portion of building, parallel with lines of the building.

4. Make connections to equipment so that weight of piping does not rest on equipment. Provide floor stands and/or hangers to carry piping weight. Make final connections to equipment so that equipment may be removed without disturbing piping.

B. VALVES, COCKS, AND FAUCETS;
1. Install valves at all connections to all equipment and elsewhere as may be necessary for complete control or isolation of any piece of equipment or service to branch lines.

3.02 INSTALLATION:

A. PIPE AND PIPE FITTINGS
1. STEEL PIPE CONNECTIONS

a. Screw joint steel piping up to and including 2 inches. Weld piping 2-1/2 inches and larger, including branch connections.
b. Die cut screwed joints with full cut standard taper pipe threads with red lead and linseed oil or other nontoxic joint compound applied to male threads only.
c. Use main sized saddle branch connections or directly connecting branch lines to mains in steel piping if main is at least one pipe size larger than the branch for up to 6 inch mains and if main is two pipe sizes larger that branch for 8 inch and larger mains. Do not project branch pipes inside the main pipe.
d. Make screwed joints with full cut standard taper pipe threads with red lead and linseed oil or other approved nontoxic joint compound applied to male threads only.
e. Use grooved mechanical couplings and mechanical fasteners only in accessible locations.
f. Make connections to equipment and branch mains with unions.
g. Provide nonconducting type connections wherever jointing dissimilar metals in open systems.

2. CAST IRON PIPE CONNECTIONS
   a. Joints for Bell and Spigot Pipe: Neoprene gasketing system.
   b. Joints for Plain End Pipe: Gasket and clamp, mechanical fastener.
3. PLASTIC PIPE CONNECTIONS
   a. Form solvent joints in PVC pipe and fittings to ANSI/ASTM D2855.
   b. Make connections to equipment and branch mains with unions.
4. COPPER PIPE CONNECTIONS\
   a. Form hot soldered joints in copper, brass, or bronze fittings with 95-5 solder. Make connections to equipment and branch mains with unions.
5. VITREOUS PIPE CONNECTIONS
   a. Joints for Bell and Spigot Pipe: (Lead and oakum) (Neoprene gasketing system).
   b. Joints for Plain End Pipe: Neoprene gasket and clamp system.
6. ROUTES AND GRADES
   a. Route piping in orderly manner and maintain proper grades. Install to conserve headroom and interfere as little as possible with use of space. Run exposed piping parallel to walls. Group piping whenever practical at common elevations. Install concealed pipes close to building structure to keep furring to a minimum.
   b. Slope water piping 1 inch in 40 feet and arrange to drain at low points.
   c. On closed systems, equip low points with 3/4 inch drain valves and hose nipples. Provide, at high points, collecting chambers and high capacity float-operated automatic air vents.
   d. Make reductions in water pipes with eccentric reducing fittings installed to provide drainage and venting.
   e. Grade horizontal drainage and vent piping 1 /4 inch per foot where practical, 1 /8 inch per foot minimum.
   f. Install piping to allow for expansion and contraction without stressing pipe or equipment connected. Provide clearance for installation of insulation and for

access to valves, air vents, drains and unions

g. Install same type piping material specified for inside building to 5 feet outside building.

7. PIPE SCHEDULE
   a. Fuel Gas: Steel Schedule 40, black.
   b. Condensate Drains: Type "M" hard copper.
   c. Sanitary Drainage and Vent and Roof Drainage Above and Below Grade: PVC.
   d. Sanitary Sewer Outside Services: PCV.
   e. Domestic Water unburied: Type "L" hard copper
   f. Domestic Water buried: Type "K" hard copper.
   g. Refrigerant Piping Manufacturer's pre-charged copper tubing.
   h. Use factory fabricated butt weld fittings for welded steel pipes.
   i. Use long radius elbows for steel and cast iron water piping.
8. VALVES, COCKS, AND FAUCETS;
   a. Install valves with stems upright or horizontal, not inverted.
   b. Install gate valves for shut-off and isolating service, to isolate equipment, part of systems or vertical risers
   c. Install globe or angle valves for throttling service and control device or meter by-pass.
   d. Use plug cocks for gas service.
   e. Use plug cocks in water systems for throttling service. Use nonlubricated plug cocks only when shut-off or isolating valves are also provided.
   f. Provide drain valves at main shut-off valves, low points of piping and apparatus.
9. SUPPORTS, ANCHORS AND SEALS:
   a. PIPE HANGERS AND SUPPORTS
      (1) Maximum spacing and rod sizes for support of horizontal steel and copper piping as follows, but do not exceed allowable leading structures.

Nominal Pipe Size (In.)	Maximum Distance Between Support (Ft.)	Hanger Rod Dia.(In.)
1-1/2" and smaller	6	3/8
2" and 2-1/2"	10	3/8
3" and 4"	10	5/8
5" to 8"	15	3/4
10" and 12"	15	7/8
14" and larger	20	1

      (2) The spacings noted above are general case. Reduce spacings to meet loading allowances (shown on structural drawing or detailed on drawings).
      (3) Support plumbing piping per UPC.
      (4) Install hangers to provide minimum 1 /2 inch clear space between finished covering and adjacent work.
      (5) Place hanger within 30 inches of each horizontal elbow, on both sides of elbow, and 30 inches from pipe ends, tees, rises and drops.

(6) Use hangers which are vertically adjustable 1-1 /2 minimum after piping is erected. Hangers shall be finally adjusted horizontally or vertically under operating conditions.

(7) Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

(8) Where practical, support riser piping independently of connected horizontal piping.

(9) Protect pipe covering at each support with steel protection saddles or rigid insulation inserts and minimum 18 gauge shields that will transmit the lead of the pipe line directly to the support without damage to covering. Fabricated shields, Pipe Shields, Thermal Hangers, Insul-Shields, or Uni-Grip are acceptable, models as recommended by manufacturer.

(10) Support piping on roof by clamping to angle iron steel supports, or as detailed on drawings.

(11) Install anchors and guides of suitable design and adequate strength for guidance of piping subject to expansion and contraction due to temperature changes, with anchors securely attached to building frame.

(12) Provide roller hangers or roller chairs where required due to expansion movement of pipe

(13) Support condensate drains to prevent sagging between hangers.

10. EQUIPMENT BASES AND SUPPORTS
    a. Construct supports of structural steel members or steel pipe and fittings. Brace and fasten with flanges bolted to structure.
    b. Provide rigid anchors for ducts and pipes immediately after vibration connections to equipment.
11. PRIMING
    a. Prime coat exposed steel hangers and supports. Hangers and supports located crawl spaces, pipe shafts and suspended ceiling spaces are not considered exposed.
12. FLASHING
    a. Flash and counterflash where mechanical equipment passes through weather or waterproofed walls, floors and roof.
    b. Flash vent and soil pipes projecting 3 inches maximum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with minimum 24 inches by 24 inches sheet size. For pipes through outside walls turn flange back into wall and caulk.
    c. Provide continuous lead or neoprene safes below (air supply casing) (build-up mop sinks) (shower stalls) shower room floors located above finished rooms. Solder at joints, flash into floor drains and turn up 6 inches into wall or to top of curbs and caulk into joints.
    d. Provide flashing around ducts and pipes passing from equipment rooms, installed according to manufacturer's data for sound control.
13. SLEEVES

a. Set sleeves in position in advance of concrete work. Provide suitable reinforcing around sleeves.
b. Extend sleeves through potential wet floors 1 inch above finished floor level. Caulk sleeves full depth and provide floor plate.
c. Where piping or ductwork passed through floor, ceiling or wall close off space between pipe or duct and construction ;with noncombustible insulation. Provide tight fitting metal caps on both sides and caulk.
d. Install chrome plated escutcheons where piping passes through finished surfaces.

14. EXPANSION COMPENSATION:
    a. Provide structural work necessary to control expansion and contraction of piping.
    b. Provide pipe guides, anchors, pipe loops, piping offsets and swing joints where required to control movements of piping under expansion and contraction.

3.03 CLEANING:

A. General: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the Work, free from accumulation of sawdust, cut ends and debris.

"'" END OF SECTION `'"

DIVISION 16 - ELECTRICAL

SECTION 16050 - GENERAL PROVISIONS - ELECTRICAL

PART ONE - GENERAL

1.01. DESCRIPTION:

A. INTENT AND DESCRIPTION OF WORK:
   1. This section includes work of the several kinds specified or indicated necessary to complete the construction shown on the drawings, together with other specified items of electrical work incidental thereto and those items that can be reasonably inferred or taken as belonging to the work and necessary in good practice to complete the system described or shown as intended.
   2. Mention herein or indication on the drawings of articles, materials, operations or methods requires that this contractor provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated each operation prescribed; and perform all necessary labor, equipment and incidentals.

B. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
   1. Electrical power and lighting system.
   2. Coordination of equipment installation and electrical connections of heating, ventilating and plumbing equipment
   3. Rough-in wiring and conduits for telephones and television systems.

C. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. All Sections of Division 16.

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.

B. The Electrical Contractor shall submit one complete list of materials showing the type, size, rating, style, catalog numbers, manufacturers' names and drawings, photos, and/or catalog data sheets for each of the following items to assure compliance with these specifications. This information shall be submitted to the Architect within thirty (30) calendar days after award of this work and shall be subject to his approval.

1. Panels Disconnects, Circuit Breaker.
2. Receptacles, Switches, Covers.
3. Lighting Fixtures.
4. Other Systems where noted

1.03. QUALITY ASSURANCE:

A. Standards:
   1. Where products are specified by manufacturer, brand name or catalog number, this establishes the standard of quality and style of the product to be provided under the Contract, unless a change in quality is approved by the Architect.

B. Materials and Equipment:\
   1. Where two or more units of the same class of equipment are required, these units shall be the products of a single manufacturer.
   2. Electrical Contractor is cautioned to use care in the selection of the equipment it proposes to furnish, e.g., regarding the size, coordination, space limitation and/or building openings to meet the basic requirements of the Contract. The cost of any alterations caused by the failure to comply with the above instructions shall be borne by this contractor.

C. TESTS
   1. Conduct such tests as may be necessary to demonstrate the continuity of the system.

D. INSTRUCTION FOR OWNER PERSONNEL:
   1. Provide for a complete indoctrination and instruction period for Owner personnel after all systems involved are complete and operating in good order. Instructions must be provided by qualified representatives of the equipment manufacturer or supplier.

E. ELECTRICAL OPERATING INSTRUCTION AND MAINTENANCE MANUALS:
   1. Scope: Prepare manuals describing the operations, servicing, and maintenance requirements of all electrical equipment provided and complete parts lists following approval and installation of all electrical equipment and prior to acceptance of the electrical work.
   2. Number of Copies: Transmit three copies of the manual to the Architect for approval.

F. RECORD DRAWINGS:
   1. The Electrical Contractor shall keep one record set of drawings marked up to date with all changes or deviations from the original electrical drawings.
   2. This subcontractor shall call to the attention of the Architect any error, conflict, or discrepancy in the plans and/or the specifications coming to his attention, and he is not to proceed with any questionable items of work until clarification has been made. Abide by Architect's reasonable decision where discrepancies occur and pre-bid instructions have not been obtained.
   3. At the completion of the work, this contractor shall deliver to the Architect a clean, neat, legible set of marked up drawings showing the electrical work as actually installed along with such other information as will indicate any deviations, additions or omissions from the Contract Drawings and Specifications.

G. PERMITS, CODES AND INSPECTIONS
   1. All requirements of the serving utilities shall govern the installation. The utilities shall be notified at the time work is started on the project and plans submitted. Provide temporary service for construction. Pay utility costs, if any.
   2. Comply with the National Electrical Code and other applicable codes, latest revision

of each.

3. Obtain all permits, inspections, etc., required by Code. All fees shall be included in the Contract Sum.
4. Furnish to the Architect evidence of the approval of the inspection authority at the completion of the project.
5. It is the responsibility of the electrical contractor to inspect the site to determine the working conditions.
6. Prospective bidders shall thoroughly inspect and review all Architectural, Mechanical and Electrical plans and specifications prior to bidding. All problems shall be brought to the attention of the Architect prior to bid date. Verify all box depths to fit in walls intended.

1.04. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.05. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700.
B. Guarantee the complete installation against defects in materials and workmanship which may occur under normal usage for a period of one (1) year after final acceptance of the work. Such defects, if they occur, shall be promptly remedied without cost to the Owner.

1.07. EXTRA MATERIALS:

A. Comply with pertinent provisions of Section 01700 and individual Sections.

PART TWO - PRODUCTS

2.01. MATERIALS:

A. All materials and equipment shall be approved by Underwriters Laboratories, Inc., or by the local inspection authority. Unload and store materials as required to prevent theft, damage, or corrosion.

2.02. NAME PLATES:

A. Contractor shall provide and install coded nameplates on all panels, motors, and devices.
B. The name plate shall be black lamicoid, white core, 1 /16" thick, and shall have 3/16"

lettering on a 3/8 by 1 1 /4" name plate, minimum.

PART THREE - EXECUTION

3.01. GENERAL METHODS AND REQUIREMENTS

A. Conceal all wiring in finished areas.
B. The entire installation shall be made in a neat, workmanlike, finished, approved and safe manner. Best practices of the trade shall prevail. The work shall be under competent supervision at all times. All costs to be included in the original contract, alterations requiring change orders shall not be started without written orders which include the cost addition or deletion.

3.02. PROTECTION:

A. Provide protection where necessary to prevent damage by other trades to the electrical installation during construction.

3.03. MOUNTING HEIGHTS AND LOCATIONS

A. Mounting heights, in general, shall be as listed herein or as specifically noted on the drawings. Consult the architectural and mechanical drawings to avoid conflict with cabinets, counters, structural members, equipment, etc. In case of doubt, confer with the Architect.

. Bracket lights As noted.
Duplex receptacles, in general 1'-6".
Duplex receptacles at counters As noted.
Wall switches 4'-0" .
Panels to center 5'-0"
Wall telephone outlets 1 '-6" .

B. When items appears in the same general area, they shall be mounted in such a way as to be symmetrical with respect to each other. If more than one item is to be mounted at the same location, the preferred method shall be one above the other.
C. Home runs may be recombined to the best advantage of the Electrical Contractor as long as all Code rules are observed and the extent of the circuiting and control are not altered.

3.04. REFERENCE DRAWINGS:

A. Electrical drawings are diagrammatical, indicating approximate locations and controls. Refer to the Mechanical, Structural and Architectural drawings. Architectural drawings shall govern. Refer to the Mechanical specifications for mechanical coordination.

3.05. CUTTING AND PATCHING OF BUILDING STRUCTURE

A. To avoid unnecessary cutting of the building structure, all inserts and conduit or cable sleeves required in the general construction for completion of the work specified herein shall be furnished and installed by the Electrical Contractor in time to avoid delay in the general construction. Should any cutting of the building construction be required to provide sleeves, and other openings, the Electrical Contractor shall be responsible for all the necessary cutting and patching for the electrical work. Patching shall be done by the proper skilled tradesman for the materials involved.

B. Under no circumstances shall any cutting, or burning of the structural parts of the building be undertaken without authority of the Architect.

3.06. PAINTING:

A. Of all the electrical work shall be performed by the General Contractor and shall not be included in the electrical work, unless noted otherwise.

3.07. MANUFACTURER'S INSTALLATION DETAILS:

A. Follow exactly where available. Provide special wiring or fittings required.

3.08. ACCESSIBILITY OF EQUIPMENT:

A. Install equipment so as to be accessible for operation, maintenance or repair. Provide adequate working space.

B.

3.09. CLEANING UP:

A. Keep site clean on a day-to-day basis.

***** END OF SECTION *****

SECTION 16110 - RACEWAYS

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
   1. Furnish and install raceways for the electrical systems for lighting, power and telephone, as shown on Drawings and specified herein.
      a. All wiring in the Site Storage Units and Items from the House Panels shall be run in raceways.
      b. All Rough-in for Telephone and Television shall be run in raceways.
      c. Residence units shall have raceways only where specifically required by Codes, Regulations, these Specifications, Etc.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 16050 - General Provisions.
   3. Section 16120 - Conductors:
   4. Section 16170 - Disconnects, Panels & Circuit Breakers:
   5. Section 16400 - Electrical Service & Distribution:
   6. Section 16500 - Lighting:

C. Definitions:
   1. All references to "NEC" will be interpreted to mean the National Electrical Code, latest approved edition.

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.

1.3. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.4. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.5. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.6. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. MATERIAL:

A. CONDUIT:
   1. Rigid aluminum conduit: UL labeled.
   2. Rigid steel conduit (GRS): Hot dipped galvanized or sherardized heavy-wall or intermediate grade, UL labeled.
   3. Electrical metallic tubing (EMT): UL labeled.
   4. Flexible steel conduit: Galvanized, UL labeled.
   5. Rigid non-metallic conduit, UL labeled.

B. CONDUIT FITTINGS:
   1. Rigid metallic conduit fittings: Threaded hub type.
   2. Rigid metallic bodies and boxes: Threaded hub, cast type, by Raco, Bowers, Appleton, Crouse-Hinds, or approved equal.
   3. Electrical metallic tubing fittings: Provide insulated throat at all connectors. No fittings of any size shall be die cast.
   4. Electrical metallic tubing boxes: One-piece, galvanized steel, of sufficient size to accommodate wires, connections, fixtures and devices. Use deep boxes with conduits 1" and larger. Provide boxes by Raco, Bowers, Appleton, Steel City Electric, or approved equal.
   5. Boxes: Light outlet boxes shall be 4" x 4" x 1 1 /2" octagonal.
   6. Conduit expansion joints: With ground jumper, such as Type XJ, by Crouse-Hinds, Appleton or approved equal.

2.02. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. INSTALLATION:

A. GENERAL RACEWAY INSTALLATION:
   1. Install raceways and supports as required for each space and condition by NEC.

B. CONDUIT INSTALLATION:
   1. Furnish conduit in standard lengths. Protect ends of conduit lengths during storage

and handling to exclude dirt, moisture and foreign substances.

2. One-half inch conduit shall be the smallest size used.
3. Rigid non-metallic conduit (PVC) shall be allowed under concrete or underground, where permitted by NEC and local code.
4. Run exposed conduits parallel to and at right angles to the building lines.
5. Aluminum conduit shall not be placed in contact with concrete.
6. Conduit embedded in concrete or installed underground shall be rigid steel or PVC.
7. Place conduits embedded in concrete such that there is a minimum of 2" of concrete cover from conduit surface and a minimum of 1 1 /2" of concrete between conduit surfaces of adjacent conduits.
8. Conduit shall be continuous from outlet to outlet. Threaded conduits terminating at metal boxes without threaded hubs shall be furnished with double locknuts and an insulated type bushing. Open conduit ends shall have a bushing unless other terminations are shown or specified. Electrical metallic tubing box connections shall provide electrical continuity.
9. Conduit expansion joints shall be installed where conduit runs exceed 150', and across building expansion joints, and at other locations.
10. Install cmnduit to avoid pipes. A minimum separation of 1" shall be maintained where conduits are run parallel to or across foreign pipes.
11. Cut conduit ends square. Thread rigid conduit and ream to remove burrs and sharp edges.
12. Avoid the use of dissimilar metals in contact anywhere in the system to eliminate the possibility of galvanic action.
13. Make conduit joints with approved couplings and unions. Conduit runs shall be straight and true. Elbows, offsets and bends shall be uniform and symmetrical.
14. Use flexible steel conduit only where flexibility is required. Runs of flexible steel conduit shall not exceed 8 feet in length.
15. Where flexible connections are needed on an exposed raceway installation, use liquid tight flexible conduit, where moisture may be encountered.
16. Conduits are to be cleaned and free from debris before pulling wire.
17. All empty conduits shall be permanently identified as to their destination with permanent tags or labeling.

C. OUTLET INSTALLATIONS:

D. Outlet boxes shall be securely fastened. Boxes installed in finished ceilings, walls or columns shall be set so that the front edge of the box is flush with the finished ceiling wall or column.

E. SUPPORT INSTALLATION:\

1. Electrical Contractor shall select and design supports for the combined weight of conduit, hangers and conductors.
2. Where conduits are run individually, support them by sturdy pipe hangers, secured by means of toggle bolts on hollow masonry, by expansion shields and machine screws or standard preset inserts on concrete or solid masonry. Screws and bolts on metal or wood, and nails in wood.

3. Conduits installed exposed on the surface in damp locations or in refrigerated areas shall be installed to prevent accumulation of moisture around the conduits. Install insulating barriers in raceways between refrigerated and normal temperature areas.
4. Adjustable hangers may be used to suspend 1 1 /4" or larger conduits when separately located.

***** END OF SECTION *****

SECTION 16120 - CONDUCTORS

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:

1. Furnish and install wires, cables and buses for all electrical systems as shown on Drawings and specified herein.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;

1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 16050 - General Provisions:
3. Section 16110 - Raceways and Supports:
4. Section 16170 - Disconnects, panels and circuit breakers:
5. Section 16400 - Electrical service and distribution:
6. Section 16500 - Lighting:

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.

1.03. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.04. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.05. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. MATERIAL:

A. CONDUCTOR REQUIREMENTS:
   1. Shall be: Copper, 98% minimum conductivity. Aluminum wire is approved for feeders of equivalent capacity of copper. Conduits must be increased in size as required. Use compression fittings on aluminum terminations and oxide prohibiter.
   2. Shall be of grade required by National Electric Code (NEC) for each use, thermoplastic insulated for 600Vac service, by Anaconda, General Cable, General Electric, Rome Cable, or approved equal.\
   3. Minimum Conductor Size:
      a. 12AWG, except that 14AWG may be used within lighting fixtures and stranded wire in control and signal circuits.
   4. Conductor Types:
      a. Control: 600Vac minimum, 19 strand, THHN or THWN.
      b. Other: THW stranded.
   5. Wiring to Lighting Fixtures:
      a. Rated for 600Vac and 90C service minimum.

B. WIRE CONNECTIONS AND DEVICES:
   1. Splices and Connections, 18AWG to 8AWG: Electrical spring connectors, plated for corrosion protection.

2.02. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.1. GENERAL:

A. WIRE CONNECTIONS, SPLICES AND TERMINATIONS:
   1. Provide same color wire on both sides of all splices.

3.2. INSTALLATION:

A. INSTALLATION OF CONDUCTORS:\
   1. Exercise care when installing conductors so as not to damage conductors. Handle according to manufacturer's recommendations. Do not bend to a radius smaller than specified or recommended.
   2. Any kinky conductors shall be removed from the project site.
   3. No pulling lubricant other than that approved by the conductor manufacturer shall be used in pulling in any conductor. Before pulling in conductor, all conduits shall be cleaned. Keep free of all foreign material throughout construction.

B. IDENTIFICATION OF CONDUCTORS:
   1. Feeders:

a. Unless noted otherwise, conductors shall be identified according to National Electric Code requirements.
b. For identification purposes, vinyl plastic color coding tape shall be used for all PVC and polyethylene jacketed conductors.

***** END OF SECTION *****

SECTION 16170 - DISCONNECTS, PANELS AND CIRCUIT BREAKERS

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
   1. Furnish and install all disconnects, panels and circuit breakers as shown on the Drawings and specified herein.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 16050 - General Provisions:
   3. Section 16110 - Raceways:
   4. Section 16120 - Conductors:
   5. Section 16400 - Electrical Service and Distribution:

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.
B. Submit Product Data on all items specified herein.

1.03. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.4. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.05. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. MATERIAL:

A. DISCONNECT SAFETY SWITCHES:
   1. Qualities: Heavy duty, quick make-quick break type, with covers. Provide fused switches except where unfused types are shown on Drawings.
   2. Covers: Safety interlocked enclosures, conforming to NEMA requirements.
   3. Source: General Electric, ITE, Square D, Sylvania, Westinghouse or approved equal.

B. FUSES
   1. Qualities: Dual element, cartridge type.
   2. Current Rating: As needed to protect circuit.
   3. Voltage Rating: As shown or specified.
   4. Source: Bussman, Chase-Shawmut, or approved equal.

C. PANELBOARDS
   1. Branch panels to be flush mounted as indicated with flush lift latches and locks and with typewritten protected circuit schedules listing each circuit. Space names and numbers appearing on the circuit schedules shall be those assigned by the Owner and not necessarily the names appearing on the Drawings. Provide circuit breaker handle guards over breakers supply all heating and ventilating units. Panels to be circuit breaker type plug-in. No spring clips allowed on door latches.

D. CIRCUIT BREAKERS
   1. Minimum width of circuit breakers shall be 3/4".
   2. Minimum interrupting capacity shall be 10,000 amperes.
   3. GFI circuit breakers, where required, shall be GE TQL 1120 GF, or equal. GFI receptacles may be substituted.
   4. SOURCE: Alwalt, Culter-Hammer, G.E., Gould, ITE, Sylvania, Square D and Westinghouse are approved manufacturers.

PART THREE - EXECUTION

3.01. INSTALLATION:

A. Install panels and fasten them to building structure independently of the conduits and conductors that enter them. Provide non-vibrating supports.
B. Install circuit breakers and conductors as indicated on the plans.
C. Provide permanent identification of circuits using plastic labels. Per Section 16050.

***** END OF SECTION *****

SECTION 16400 - SERVICE AND DISTRIBUTION

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 16050 - General Provisions.
3. Section 16110 Raceways.
4. Section 16120 - Conductors.

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.
Submit product data on all items specified herein.

1.03. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.04. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.05. DELIVERY, STORAGE AND HANDLING:

B. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. GENERAL:

A. APPROVED MANUFACTURERS:

1. G.E., Square D, WECO, ITE, Sylvania, Alwalt.

B. ELECTRICAL SERVICE\
1. Install secondary feeders of size shown on the drawings for a 120/240 volt, 1 phase 3 wire system. Power company to run main service entrance wiring.

2.02. MATERIAL:

A. Main distribution panels shall be circuit breaker type 22,000 amps interrupting capacity. 1. Aluminum bus bar is not approved.

2.03. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. GENERAL:

A. UNDERGROUND WORK
1. Electrical Contractor shall be responsible for all excavating, concrete work and backfilling, unless otherwise noted. Electrical Contractor shall furnish and install all conduit, fittings, and grounding, unless otherwise noted.

3.02. INSTALLATION:

B. CONDUIT
1. Adapters shall be provided where the conduit run changes from PVC to heavy wall steel conduit
construction.

C. GROUNDING
1. Provide grounding for all metal cases, frames, conduits, neutral conductors in accordance with
Code rules. Grounding connectors shall be pressure type equal to Fargo, Kearney or Burndy.
2. Where PVC duct used, run separate grounding wire.

D. MAIN DISTRIBUTION PANEL (MDP)
1. Install the MDP, breakers and all necessary appurtenances required for the system and per NEC,and local code.
2. The MDP shall be securely fastened at points provided by the manufacturer.

E. LABELING
1. On the MDP, provide exterior plastic engraved nameplate showing name of project,

year and Electrical Contractor.

2. On all cabinets, safety switches, magnetic starters, remote switches, time switches and other apparatus used for operation and control of circuits, appliances and equipment installed under this contract shall be properly identified by means of a neatly stenciled or printed label, or embossed or engraved nameplates. Those in public view shall be plastic engraved. Instructions shall be provided and all equipment shall. be identified so as to be easily and safely operated by the Owner's maintenance personnel.

***** END OF SECTION *****

SECTION 16500 - LIGHTING

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:

1. Furnish and install a complete and operating interior and exterior lighting system with equipment specified herein and shown on the Drawings.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;

1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 16050 - General Provisions:
3. Section 16110 - Raceways.
4. Section 16120 - Conductors:

C. DEFINITIONS:

1. The abbreviation or reference to "NEC" will be interpreted to mean the National Electrical Code.
2. The abbreviation or reference to "HID" will be interpreted to mean High Intensity Discharge.

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.
B. Submit product data for all equipment specified herein.

1.03. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.04. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500

.

1.05. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. GENERAL:

A. APPROVED MANUFACTURERS:
   1. Fixtures and lamps shall be of the types specifically approved for the project as listed in the schedule and as indicated on the drawings.

2.02. MATERIAL:

A. LAMPS AND BALLASTS
   1. Incandescent lamps shall be 130 volt of the wattage indicated; G.E., Westinghouse or Sylvania, inside frosted or special types shown or indicated.
   2. Fluorescent lamps shall be Energy Efficient, T12, cool white, 48", 34 watt, 2850 lumens, premium, 12000 hour life, designed for operation with Energy Efficient rapid start ballasts without the use of external starter devices.
   3. All defective lamps shall be replaced with new lamps within two working days of notification at no cost to the Owner. These lamps shall be guaranteed for one (1) year after final acceptance by the Owner.

B. Certified ballasts shall be minimum 90% power factor, rapid start, two-lamp, Jefferson, Advance, Westinghouse, or G.E. Sound rating "A" or better. Ballasts to be considered defective if noise is excessive. Energy efficient ballast - total 75 watts maximum for 2 lamps and ballast.

C. Fixtures shall be tested and cleaned in place and shall be new, of recognized manufacture, good quality, bearing the "UL" label. Fixture wire shall be of a type and size approved for maximum heat conditions encountered. Fixtures to be clean at time of final acceptance. Exterior fixtures to be insect proof.

2.03. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. GENERAL:

A. Refer to other appropriate sections of these specifications for installation of Lighting Fixtures.

*** END OF SECTION ***

SECTION 16700 - COMMUNICATION

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to:
   1. TELEPHONE SYSTEM
   2. TELEVISION SYSTEM
   3. COMPUTER NETWORK WIRING

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 16050 - General Provisions.
   3. Section 16110 - Raceways.

C. WORK FURNISHED AND INSTALLED BY THE CONTRACTOR
   1. Furnish and install cable TV lead-in conduit and TV outlet boxes with plates and conduit as specified herein. Future TV lead-in cable shall be furnished, installed, and connected by others.

1.02. SUBMITTALS:

A. Submit required information in accordance with Section 01300.

1.03. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.04. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.06. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

1.07. EXTRA MATERIALS:

A. Comply with pertinent provisions of Section 01700.
B. Provide 12 extra blank cover plates for each telephone and television outlets.

PART TWO - PRODUCTS

2.01. GENERAL:

A. The Telephone and Television Systems indicated to be install in conduit min of 314", for installation of the system by others.
B. Provide pull wire in all empty conduit.

2.02. MATERIAL:

A. TELEPHONE SYSTEM
   1. Boxes: 4" x 4" x 1 112" square outlet boxes and matching cover plates.
B. TELEVISION SYSTEM
   1. Cable lead-in conduit shall be 3/4-inch conduit.
   2. TV outlet boxes shall be 4" x 4" x 1 1/2" square outlet boxes and and shall be provided with television outlet and plate to match the wiring devices.

2.03. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. INSTALLATION:

A. TELEPHONE SYSTEM
   1. Verify each location with telephone company and Owner's Representative. Pay telephone
      company charges. Owner to pay for the instruments.
   2. All conduits to be EMT, GRS, or PVC as shown on the drawings or as required by the phone
      company representative.
   3. Telephone instruments will be installed by others.
   4. Provide backboard panel, gounding and power. Coordinate with telephone company.
B. TELEVISION SYSTEM
   1. TV outlet boxes shall be located as shown on the Drawings.
   2. Provide 3/4" conduit from a point 18" below grade, and 24" from the face of

foundation to a weatherproof 4" square J-box with cover plate on the building exterior 12" above finish grade.

***** END OF SECTION *****

SECTION 16850 - MECHANICAL EQUIPMENT CONNECTIONS

PART ONE - GENERAL

1.01. DESCRIPTION:

A. WORK INCLUDES: The portion of the work covered by this section includes but is not necessarily limited to
   1. It is the intent of this specification to provide complete and satisfactory connection electrically to each piece of mechanical equipment shown on the drawings including all necessary devices, cord, caps, grounding, and incidental equipment, materials and labor required to place each item in service electrically.

B. RELATED WORK SPECIFIED ELSEWHERE: Documents affecting work of this Section include, but are not necessarily limited to;
   1. General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Division 15 as appropriate.
   3. Division 16 as appropriate.

1.02. QUALITY ASSURANCE:

A. Comply with pertinent provisions of Section 01400.

1.03. JOB CONDITIONS:

A. Comply with pertinent provisions of Section 01500.

1.04. DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.

1.05. GUARANTEE:

A. Comply with pertinent provisions of Section 01700 and 01740.

PART TWO - PRODUCTS

2.01. MATERIAL:

A. Conduits, conductors, connectors and appurtenances to be furnished and installed by the Electrical Contractor. These items are fully described in previous sections of this specification.

B. Mechanical heating and ventilating equipment shown on the drawings, including all

motors, thermostats, magnetic starters, and special control devices will be furnished by the Mechanical Contractor except as noted.

C. The magnetic starters for heating and ventilating are a part of the temperature control system by the Mechanical Contractor.

D. The Electrical Contractor shall furnish and install all disconnects required by NEC as well as other devices shown or indicated.

2.02. OTHER MATERIALS:

A. Provide other materials, not specifically described but required for a complete and proper installation.

PART THREE - EXECUTION

3.01. INSTALLATION:

A. Provide all power wiring complete, including mounting and wiring of miscellaneous motor starters and final connections to the motors.

B. Provide line voltage control wiring as indicated on the drawings.

1. The Electrical Contractor shall make tests on the electrical operation of all major equipment and supply the Engineer with voltages and current readings on all motors under at rest, starting and running conditions.

***** END OF SECTION *****